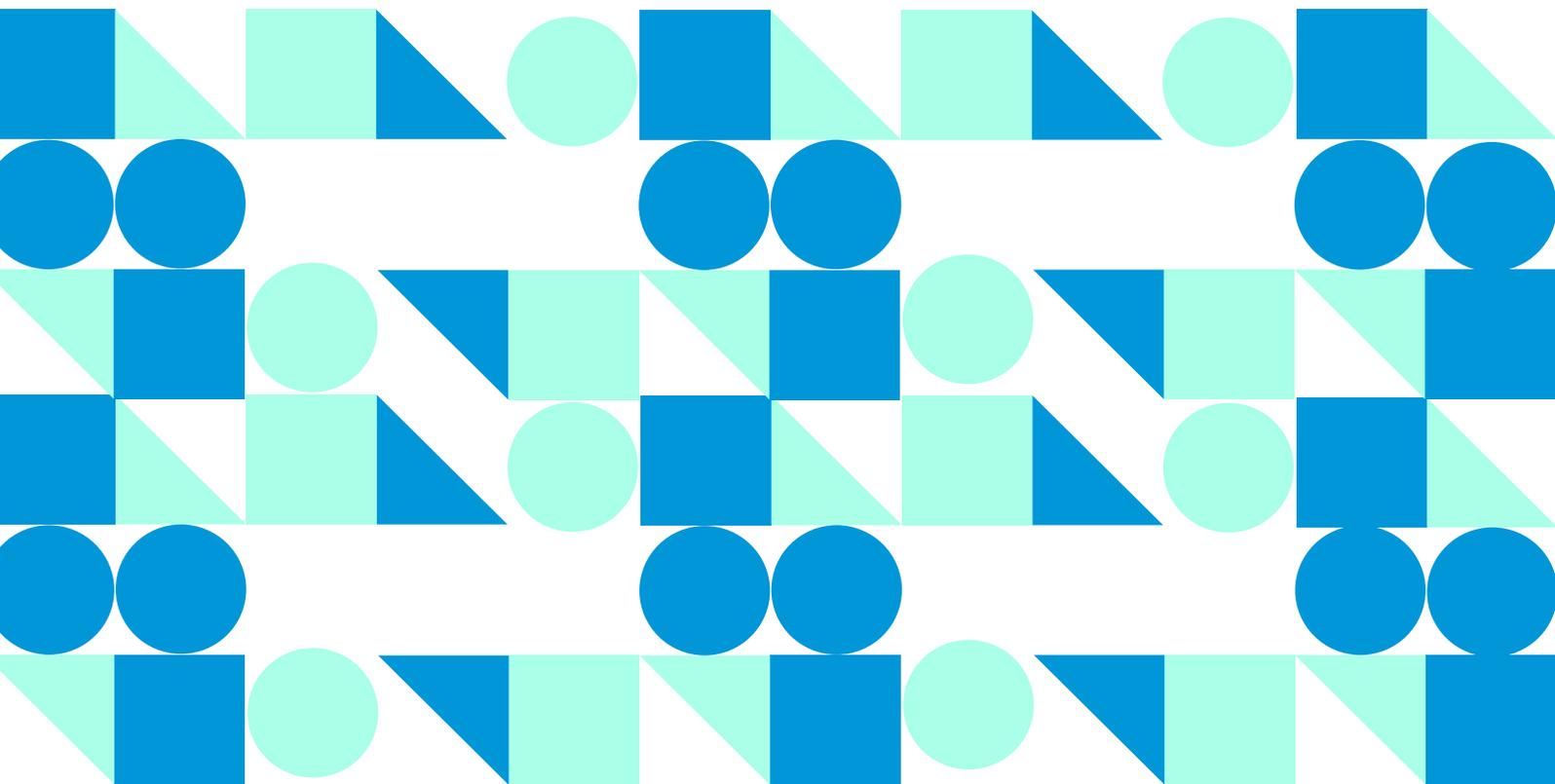




Research paper

The role of work-based learning in VET and tertiary education

Evidence from the 2016 EU labour
force survey





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The **European Centre for the Development of Vocational Training** (Cedefop) is the European Union's reference centre for vocational education and training, skills and qualifications. We provide information, research, analyses and evidence on vocational education and training, skills and qualifications for policy-making in the EU Member States.

Cedefop was originally established in 1975 by Council Regulation (EEC) No 337/75. This decision was repealed in 2019 by Regulation (EU) 2019/128 establishing Cedefop as a Union Agency with a renewed mandate.

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Foreword

Promoting and expanding the role of work-based learning in education and training remains central to EU vocational education and training (VET) and skills policies post 2020. The *European skills agenda for sustainable competitiveness, social fairness and resilience*, the *Council recommendation on a bridge to jobs*, and the *Council recommendation on VET* all advocate increasing the share of young people benefiting from work-based learning and increasing its quality. The VET recommendation foresees a reinforced European Alliance for Apprenticeships (EAfA) and proposes several measures to develop apprenticeship provision, notably in sectors driving the green and digital transitions.

While current EU policy ambitions for work-based learning are a logical follow-up to priorities set earlier and past achievements, the economic and social context is becoming increasingly dynamic and disruptive. Megatrends, such as automation, are transforming jobs, and the fallout of the Covid-19 crisis is considerable. Apart from severe economic impact, the pandemic is also making it more difficult to secure work-based learning opportunities, particularly in sectors heavily affected by temporary closures and social distancing measures.

Work-based learning policy that is evidence-based needs reliable statistical information. This report is part of Cedefop's continuing effort to provide such information to inform EU and national policies in VET, skills and qualifications. It helps map the landscape of work-based learning in VET and in tertiary education in the EU, reflecting on how widespread it is and what its labour market outcomes are. The report fully taps into the new information on work-based learning available in the 2016 ad hoc module of the EU labour force survey (LFS), which used an experimental and innovative approach to measure it.

Cedefop analysis demonstrates that work-based learning is more widespread than apparent from work using other data sources. These sources have not fully captured the impact of policies and measures promoting and popularising it. While the report confirms work-based learning is crucial to the education-to-employment transition, for various reasons, not all countries benefit equally. This justifies continued attention to education and training policies aimed at availability and quality of work-based learning, including in apprenticeships.

Developing a foundation for lifelong learning and adaptability to change, work-based learning prepares young people for today's and tomorrow's labour market. We trust this report – by providing a more complete image of work-based learning in the EU and its benefits – will contribute to the policy discourse and support

evidence-based policy-making. We hope its insights will help shape ideas for further research and analysis.

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Contents

Foreword.....	1
Contents.....	4
Executive summary.....	13
1. Introduction	27
1.1. Aim, scope and structure of this study.....	27
1.2. Towards a common understanding of work-based learning	28
1.3. Work-based learning in European policies	29
1.4. Work-based learning and labour market outcomes: related literature.....	32
1.5. Work-based learning and data availability in Europe	34
2. Definitions, data, methods and limitations.....	37
2.1. Definition of work-based learning	37
2.2. Population of interest.....	39
2.3. Sociodemographic characteristics of graduates	40
2.4. Labour market outcomes.....	41
2.5. Methods and presentation of results	44
2.5.1. Descriptive statistics	44
2.5.2. Multivariate analyses	47
2.6. Data and limitations	49
2.6.1. General characteristics of the data	49
2.6.2. Data issues and limitations.....	50
3. Prevalence of work-based learning during the highest-level educational attainment.....	54
3.1. Overall prevalence of work-based learning	54
3.2. Prevalence of work-based learning by highest level of education attained	55
3.3. Profile of graduates	60
3.3.1. Gender.....	61
3.3.2. Age	69
3.3.3. Country of birth	82
4. The labour market outcomes of work-based learning: a descriptive analysis	90
4.1. Employment status.....	90

4.1.1.	Graduates from medium-level vocational education	92
4.1.2.	Graduates from tertiary education	93
4.1.3.	Summary of findings at the EU-27 level	93
4.2.	Non-precariousness of employment	97
4.2.1.	Graduates of vocational medium-level education	100
4.2.2.	Graduates of tertiary education	100
4.2.3.	Summary of findings at the EU-27 level	101
4.3.	Work in occupations with high skills intensity	104
4.3.1.	Graduates from vocational medium-level education	107
4.3.2.	Graduates from tertiary education	108
4.3.3.	Summary of findings at the EU-27 level	108
4.4.	Not searching for another job	112
4.4.1.	Graduates from vocational medium-level education	114
4.4.2.	Graduates from tertiary education	117
4.4.3.	Summary of findings at the EU-27 level	118
5.	Multivariate analysis on employment status and non-precariousness of employment	121
5.1.	Employment status	123
5.1.1.	Multilevel logistic regression analysis	123
5.1.2.	Country-specific logistic regression analyses	126
5.2.	Non-precariousness of employment (TEMPDUR)	129
5.2.1.	Multilevel logistic regression analysis	129
5.2.2.	Country-specific logistic regression analysis	132
6.	Conclusions	134
	Abbreviations/Acronyms	137
	References	139
	Further reading	146

Tables, figures and boxes

Tables

1.	Operationalisation of independent variable measuring education level, orientation and work-based learning in the multivariate regression models	49
2.	Multilevel logistic regression analyses on employment status (being employed versus being unemployed/inactive) controlling for highest education attained, experience of work-based learning as part of it and sociodemographic background variables	125
3.	Summary of findings of country-specific logistic regression analyses on employment status (being employed versus being unemployed/inactive) by highest education attained, experience of work-based learning as part of it and sociodemographic background variables (ref. categories work-based learning as part of vocational medium-level education and as part of tertiary education)	128
4.	Multilevel logistic regression analyses on non-precariousness of employment (having a contract of more than three months versus having a contract up to three months) controlling for highest education attained, experience of work-based learning as part of it, and sociodemographic background variables	131
5.	Summary of findings of country-specific logistic regression analyses on non-precariousness of employment, controlling for highest education attained, experience of work-based learning as part of it and sociodemographic background variables (ref. categories work-based learning as part of vocational medium-level education and as part of tertiary education)	133

Figures

1.	Age, gender and country of birth of graduates by type of work experiences at their highest education attained (graduates from medium-level vocational education and graduates from tertiary education, aged 20-34 and no longer in formal education), EU-27, 2016.....	17
2.	Employment rates of graduates by type of work experiences at their highest education attained (graduates from medium-level vocational education and graduates from tertiary education, aged 20-34 and no longer in formal education), EU-27, 2016	20
3.	Students in combined work- and school-based vocational programmes (% of all students in vocational programmes at upper	

	secondary and post-secondary non-tertiary education level) (ISCED 3-4)	36
4.	Overall prevalence of traineeships (EU-LFS AHM 2016 def.) and apprenticeships (EU-LFS AHM 2016 def.) experiences as part of the highest level of education attained, all education levels combined, among graduates aged 20-34 no longer in formal education)	54
5.	Prevalence of work experiences by type, including work-based learning (traineeship/apprenticeship, EU-LFS AHM 2016 def.), at the highest level of education attained, graduates aged 20-34 no longer in formal education with at most lower secondary qualification (ISCED 2 or below)	57
6.	Prevalence of work experiences by type, including work-based learning (traineeship/apprenticeship, EU-LFS AHM 2016 def.) at the highest level of education attained, graduates aged 20-34 no longer in formal education with at most a medium-level qualification of general orientation (ISCED 34, 44).....	58
7.	Prevalence of work experiences by type, including work-based learning (traineeship/apprenticeship, EU-LFS AHM 2016 def.) at the highest level of education attained, graduates aged 20-34 no longer in formal education with at most a medium-level qualification of vocational orientation (ISCED 35, 45)	59
8.	Prevalence of work experiences by type, including work-based learning (traineeship/apprenticeship, EU-LFS AHM 2016 def.) at the highest level of education attained, graduates aged 20-34 no longer in formal education with a tertiary-level qualification (ISCED 5-8)....	60
9.	Gender distribution of graduates with at most a medium-level vocational qualification (ISCED 35, 45) by type of work experience at their highest education attained, including traineeships and apprenticeships (EU-LFS AHM 2016 def.), EU-27 (graduates aged 20-34, not in formal education), 2016	62
10.	Share of males among graduates with at most a medium-level vocational qualification (ISCED 35, 45) by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016 ..	64
11.	Share of males among graduates with at most a medium-level vocational qualification (ISCED 35, 45) by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016.....	65
12.	Gender distribution of graduates with a tertiary-level qualification (ISCED 5-8) by type of work experience at their highest education attained, including traineeships and apprenticeships (EU-LFS AHM	

	2016 def.), EU-27, (graduates aged 20-34, not in formal education), 2016.....	66
13.	Share of males among graduates with a tertiary-level qualification (ISCED 5-8) by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016	68
14.	Share of males among graduates with tertiary-level qualification (ISCED 5-8) by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016	69
15.	Age groups distribution of graduates with at most a medium-level vocational qualification (ISCED 35, 45) by type of work experience during their highest education attained, including traineeships and apprenticeships (EU-LFS AHM 2016 def.), EU-27 (graduates aged 20-34, not in formal education), 2016	70
16.	Share of 25- to 29-year-olds, among graduates with at most a medium-level vocational qualification (ISCED 35, 45) by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016	72
17.	Share of 30- to 34-year-olds, among graduates with at most a medium-level vocational qualification (ISCED 35, 45) by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016	73
18.	Share of 25- to 29-year-olds, among graduates with at most a medium-level vocational qualification (ISCED 35, 45) by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016	74
19.	Share of 30- to 34-year-olds, among graduates with at most a medium-level vocational qualification (ISCED 35, 45) by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016	75
20.	Age group distribution of graduates with a tertiary-level qualification (ISCED 5-8) by type work experience at their highest education attained, including traineeships and apprenticeships (EU-LFS AHM	

	2016 def.), EU-27 (graduates aged 20-34, not in formal education), 2016.....	76
21.	Share of 25- to 29-year-olds, among graduates with a tertiary level qualification (ISCED 5-8) by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience, (graduates aged 20-34 not in formal education), 2016.....	79
22.	Share of 30- to 34-year-olds, among graduates with a tertiary-level qualification (ISCED 5-8) by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016.....	80
23.	Share of 25- to 29-year-olds, among graduates with a tertiary-level qualification (ISCED 5-8) by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016.....	81
24.	Share of 30- to 34-year-olds, among graduates with a tertiary-level qualification (ISCED 5-8) by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016.....	82
25.	Country of birth distribution (native-born and foreign-born) of graduates with at most a medium-level vocational qualification (ISCED 35, 45) by type of work experience at their highest education attained, including traineeships and apprenticeships (EU-LFS AHM 2016 def.), EU-27 (graduates aged 20-34, not in formal education), 2016.....	83
26.	Share of native-born among graduates with at most a medium-level vocational qualification (ISCED 35, 45) by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016 ..	84
27.	Share of native-born among graduates with at most a medium-level vocational qualification (ISCED 35, 45) by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016.....	85
28.	Country of birth distribution (native-born and foreign-born) of graduates with a tertiary level qualification (ISCED 5-8) by type of work experience at their highest education attained, including traineeships and apprenticeships (EU-LFS AHM 2016 def.), EU-27 (graduates aged 20-34, not in formal education), 2016.....	86

29.	Share of native-born among graduates with a tertiary-level qualification (ISCED 5-8) by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016	88
30.	Share of native-born among graduates with tertiary-level qualification (ISCED 5-8) by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016	89
31.	Employment rates of graduates by highest education attained and type of work experience at that level, including traineeships and apprenticeships (EU-LFS AHM 2016 def.), EU-27 (graduates aged 20-34, not in formal education), 2016	91
32.	Employment rates of graduates with at most a medium-level vocational qualification (ISCED 35, 45) by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016 ..	94
33.	Employment rates of graduates with at most a medium-level vocational qualification (ISCED 35, 45) by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016	95
34.	Employment rates of graduates with a tertiary-level qualification (ISCED 5-8) by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016	96
35.	Employment rates of graduates with a tertiary-level qualification (ISCED 5-8) by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016	97
36.	Share of graduates with permanent contract or temporary contract of at least three months by highest education attained and type of work experience at that level, including traineeships and apprenticeships (EU-LFS AHM 2016 def.), EU-27 (graduates aged 20-34, not in formal education and employed), 2016	98
37.	Share of graduates with at most a medium-level vocational qualification (ISCED 35, 45) having a permanent contract or a temporary contract of more than three months by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no	

	work experience (graduates aged 20-34 not in formal education and employed), 2016	101
38.	Share of graduates with at most a medium-level vocational qualification (ISCED 35, 45) having a permanent contract or a temporary contract of more than three months by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education and employed), 2016	102
39.	Share of graduates with a tertiary-level qualification (ISCED 5-8) having a permanent contract or a temporary contract of more than three months by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education and employed), 2016.....	103
40.	Share of graduates with a tertiary-level qualification (ISCED 5-8) having a permanent contract or a temporary contract of more than three months by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education and employed), 2016	104
41.	Share of graduates in a highly skilled job by highest education attained and type of work experience at that level, including traineeships and apprenticeships (EU-LFS AHM 2016 def.), EU-27 (graduates aged 20-34, not in formal education and employed), 2016	106
42.	Share of graduates with at most a medium-level vocational qualification (ISCED 35, 45) working in a highly skilled job by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education and employed), 2016	109
43.	Share of graduates with at most a medium-level vocational qualification (ISCED 35, 45) working in a highly skilled job by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education and employed), 2016	110
44.	Share of graduates with tertiary-level qualification (ISCED 5-8) working in a highly skilled job by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education and employed), 2016	111

45.	Share of graduates with a tertiary-level qualification (ISCED 5-8) working in a highly skilled job by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education and employed), 2016.....	112
46.	Share of graduates not looking for another job by highest education attained and type of work experience at that level, including traineeships and apprenticeships (EU-LFS AHM 2016 def.), EU-27 (graduates aged 20-34, not in formal education and employed), 2016.....	113
47.	Share of graduates with at most a medium-level vocational qualification (ISCED 35, 45) not looking for another job by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education and employed), 2016.....	116
48.	Share of graduates with at most a medium-level vocational qualification (ISCED 35, 45) not looking for another job by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education and employed), 2016.....	117
49.	Share of graduates with a tertiary-level qualification (ISCED 5-8) not looking for another job by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education and employed), 2016.....	119
50.	Share of graduates with a tertiary-level qualification (ISCED 5-8) not looking for another job by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education and employed), 2016.....	120
51.	Probability of being employed by highest education level and work experience.....	126
52.	Probability of having non-precarious employment by highest education level and work experience.....	132

Boxes

1.	Key EU policy initiatives relevant to work-based learning.....	13
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Executive summary

Why this report?

Work-based learning (WBL) is associated with known and documented benefits and it has a long tradition as a policy priority at European level. Several policy initiatives have been undertaken at European level to promote work-based learning (Box 1). In the post-2020 context, increasing the availability of (and the exposure to) work-based learning, along with increasing its quality, remains central to the EU policy agenda, including and particularly in vocational education and training (VET).

Box 1. **Key EU policy initiatives relevant to work-based learning**

- Bruges communiqué on enhanced European cooperation in vocational education and training for the period 2011-20 (Council of the European Union and European Commission, 2010).
- Riga conclusions (European Commission, 2015a).
- New skills agenda for Europe (European Commission, 2016).
- Council recommendation on a European framework for quality and effective apprenticeships (Council of the European Union, 2018).
- European skills agenda for sustainable competitiveness, social fairness and resilience (European Commission, 2020a).
- Council recommendation on: A bridge to jobs (Council of the European Union, 2020a).
- Council recommendation on VET (Council of the European Union, 2020b).

Source: Cedefop.

Despite its policy relevance, internationally comparable statistical information on WBL has been scarce, limiting the possibility to derive a reasonably complete picture. So far, the key source of regular and internationally comparable statistical information on work-based learning has been the annual joint UNESCO, Organisation for Economic Cooperation and Development (OECD) and Eurostat (UOE) data collection on formal education (UOE, 2016). In 2016, an ad hoc module of the EU labour force survey (EU-LFS), on young people on the labour market was piloted. It used a new approach to qualify more precisely the educational background of youngsters. The module offers the opportunity to quantify and investigate work-based learning in an innovative and internationally comparable way. It allows quantification of the stock of young graduates in the population who have actually experienced WBL as part of their highest education attained. It

enables identifying mandatory and optional WBL experiences, covers WBL which falls below the UOE methodological threshold for identifying it and includes WBL at tertiary education level. As this approach to measuring WBL was implemented within the established framework of the EU labour force survey, it is possible to identify the characteristics of graduates taking part in it and make the link to labour market outcomes.

What is this report about?

This report takes advantage of the innovations implemented in the 2016 ad hoc module (AHM) of the EU-LFS to provide new statistical evidence on WBL in Europe. It focuses on work-based learning in formal initial education and training. It aims to provide new evidence on how many young graduates experienced work-based learning as part of their highest education attained (prevalence), who they are (profiling of their sociodemographic characteristics) and how well they do on the labour market (labour market outcomes); it also compares to their counterparts who have not participated in WBL in their highest level of education attained.

The report covers the 27 Member States of the European Union, the United Kingdom and three European Free Trade Association (EFTA) countries (Iceland, Norway and Switzerland) and presents the most recent data available. While the 2016 EU-LFS ad hoc module data are considered to be of sufficient quality, they should nevertheless be seen as an experimental attempt to capture work-based learning. The results should be interpreted with this in mind.

Definitions and methods

In this report, work-based learning is operationally defined as work experience which occurred as part of the curriculum at the highest level of formal education attained. Whenever possible, the report distinguishes between two work-based learning types:

- (a) apprenticeship: defined as work experience occurring in the context of the highest level of formal education attained, whereby all of the following characteristics are combined:
 - it is a mandatory part of the curriculum;
 - it lasts six months or more;
 - it is paid (Eurostat operational definition for the 2016 ad hoc module);

- (b) traineeship: defined as work experience occurring as part of the curriculum of the highest level of education attained and missing at least one of the above-mentioned characteristics.

The analysis considers young graduates with three highest educational attainment levels:

- (a) low level (at most, lower secondary education: international standard classification of education (ISCED) 2 or below);
- (b) medium level (upper secondary or post-secondary non-tertiary: ISCED 3-4 of general and vocational orientation);
- (c) high level (tertiary education: ISCED 5-8).

The analysis focuses on graduates who had work-based learning experiences as part of their highest level of education attained. Particular attention is devoted to medium-level VET and tertiary education graduates. For comparisons and benchmarking, a selection of descriptive results is also presented for graduates who gained work experience during, but not as part of, their education; this is not considered WBL in the report (for instance side or part-time jobs to accompany or support studies). The analysis looks at youngsters aged 20 to 34 not in further formal education and all results relate to them. The analysis uses descriptive statistics and more complex multivariate logistic regressions.

How many graduates benefit from work-based learning?

Work-based learning is most prevalent in medium-level vocational education: in the EU-27, 61% of young graduates with a medium-level vocational qualification have had a work-based learning experience in the form of an apprenticeship (31%) or of traineeship (30%). Prevalence of work-based learning is also high as part of tertiary education: in the EU-27, 32% of tertiary education young graduates have been in a traineeship and 12% in an apprenticeship as part of their studies. In lower secondary education and in medium-level general education, not surprisingly, work-based learning (apprenticeships/traineeships) is rarer, with about 10% of EU-27 graduates taking part. In 18 countries, more than half of graduates from medium-level vocational education have participated in traineeships or apprenticeships. Only in three countries (Bulgaria, Greece and Romania) is the joint share of trainees/apprentices below 25%. In nine countries, more than half of tertiary education graduates have participated in traineeships or apprenticeships. In seven countries (Cyprus, Croatia, Denmark, Ireland, Norway, Romania and United Kingdom) is the joint share of trainees/apprentices below 25%. Countries

differ widely in the prevalence of work-based learning, and in the type of work-based learning that is most prevalent (apprenticeships or traineeships).

Graduates with work-based learning experience: who are they?

To analyse the sociodemographic profile of graduates with WBL experiences in VET and tertiary education, the report considers age, gender and country of birth. The analysis is enriched by means of comparison with graduates from the same level and type of education who did not acquire any work experience during their highest level of education (no work experience within or outside the curriculum).

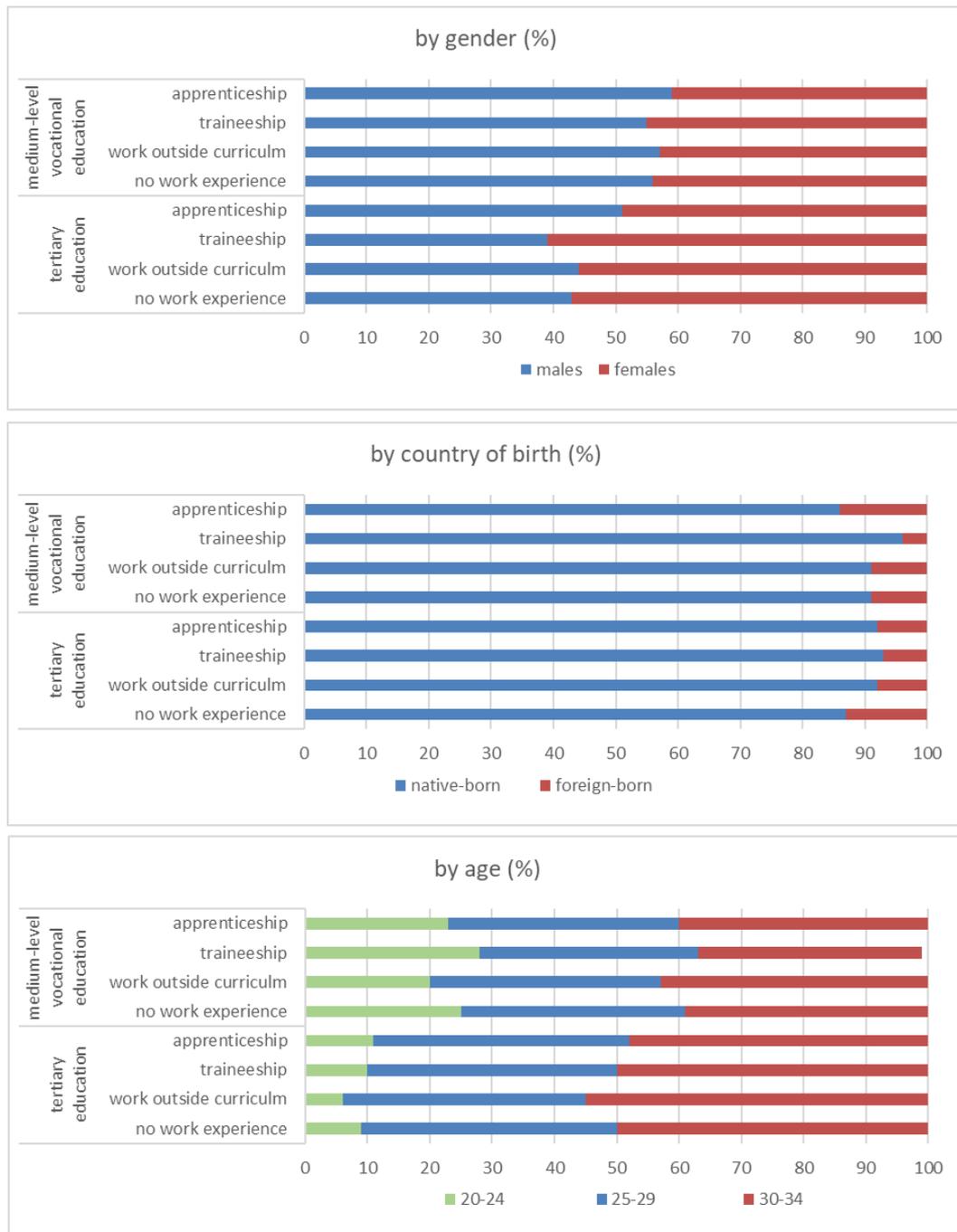
Gender

In the EU-27 as a whole, graduates from medium-level vocational education with a work-based learning experience are more frequently men: the EU-27 average share of male graduates is 55% among those with a traineeship experience and 59% among those with an apprenticeship experience. Overall, for graduates from medium-level vocational education, the gender distribution of those with a traineeship or apprenticeship experience does not differ considerably from the gender distribution of those who did not acquire any work experience during their medium-level vocational studies. At country level, compared to graduates with no work experience during their medium-level vocational studies, an underrepresentation of males is observed among graduates with a traineeship experience in six countries (France, Finland, Greece, Lithuania, Malta and Norway), and an overrepresentation in six other countries (Austria, Cyprus, Estonia, Latvia, Hungary and Switzerland). It is also found at country level that among graduates from medium-level vocational education, males are overrepresented in the group of those who had an apprenticeship experience compared to those who did not acquire any work experience during their studies: this applies in Belgium, Denmark, Ireland, Spain, France, Italy, Cyprus, Hungary, Malta, Austria, Sweden and the United Kingdom.

Among graduates from tertiary education, in the EU-27, the share of males is estimated at 51% for those who had an apprenticeship experience and at 39% for those who had a traineeship experience. Compared to tertiary graduates with no work experience during their highest studies, male graduates are overrepresented in the subgroup of those with an apprenticeship experience and underrepresented in the subgroup of those who had a traineeship experience. Among tertiary level graduates, only in the Netherlands are women overrepresented in the subgroup of

those with an apprenticeship experience compared to graduates who did not acquire any work experience.

Figure 1. **Age, gender and country of birth of graduates by type of work experiences at their highest education attained (graduates from medium-level vocational education and graduates from tertiary education, aged 20-34 and no longer in formal education), EU-27, 2016**



Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

Age

For graduates with a medium-level vocational education with a traineeship experience, the following age distribution was estimated for the EU-27 as a whole:

- (a) 29% between 20 and 24 years old;
- (b) 35% between 25 and 29 years old;
- (c) 36% between 30 and 34 years old.

The share of the youngest age group is slightly smaller for graduates from medium-level vocational education with an apprenticeship experience, for whom the following age distribution was identified:

- (a) 23% are younger than 25;
- (b) 37% are between 25 and 29 years old;
- (c) 40% are older than 30.

For the EU-27, the age distribution of vocational medium-level education graduates who participated in work-based learning (traineeship/apprenticeship) is little different from the age distribution of those who did not acquire any work experience during their highest studies.

For tertiary education graduates, in the EU as a whole, the age distribution is similar for those with a traineeship experience, those with an apprenticeship experience and those with no work experience during their highest studies:

- (a) between 48% and 50% of graduates are 30 to 34 years old;
- (b) 40% to 41% are between 25 and 29 years old;
- (c) 9% to 11% are younger than 25.

At country level, for both vocational medium-level education and tertiary education, there are differences between countries in over- and underrepresentation of the different age groups among apprenticeship/traineeship graduates and graduates with no work experience during their highest studies attained.

Country of birth

In the EU-27, among graduates from medium-level vocational education, the share of native born was estimated at 86% in the subgroup of those with an apprenticeship experience and 96% in the subgroup of those with a traineeship experience. Among medium-level vocational graduates, the percentage of native-born graduates does not differ considerably between those with and without a work-based learning experience (traineeship/apprenticeship).

For tertiary education graduates, the share of native-born individuals is similar between the subgroup of those with a traineeship experience and those with an apprenticeship experience, respectively at 93% and 92%. These shares are

somehow higher, yet not greatly so, than the proportion of native-born tertiary graduates who did not acquire any work experience (87%) during their studies. Among tertiary-level graduates, in most countries, the share of native born does not differ considerably between the group of those with an apprenticeship/traineeship experience and of those who had no work experience during their highest studies attained. We find an overrepresentation of native-born tertiary-level traineeship graduates in nine countries (Austria, Denmark, France, Finland, Luxembourg, Malta, Norway, Sweden and Switzerland). The share of native-born in the subgroup of tertiary-level graduates with an apprenticeship is higher than in the subgroup of those with no work experience during studies in Austria, Denmark, France, Finland, Norway, Switzerland and the United Kingdom; only in Belgium was it found to be considerably smaller.

Labour market outcomes: stylised facts

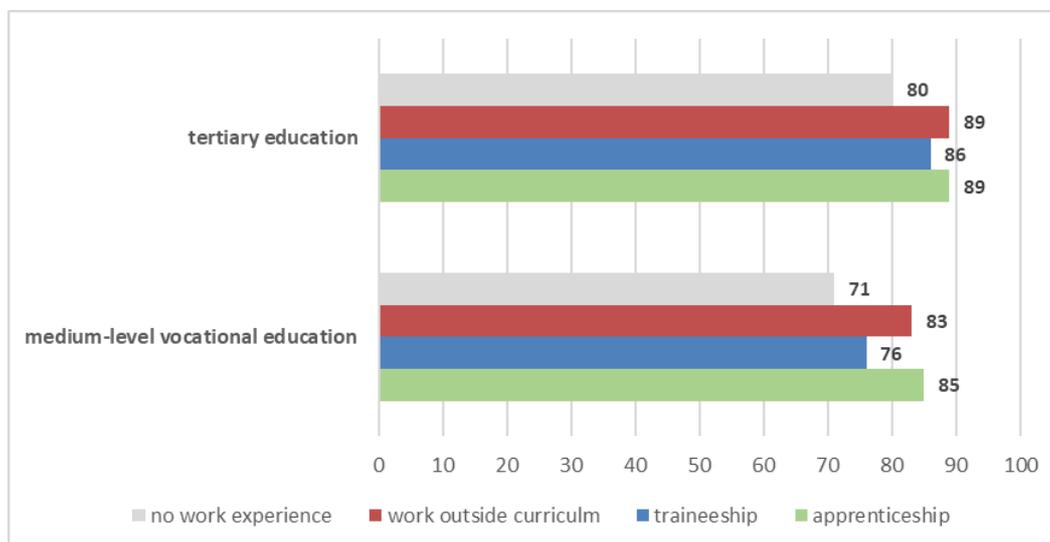
Employment status and the quality of employment are used to measure labour market outcomes. The report considers three main dimensions connected to quality of employment:

- (a) stability of employment, i.e. non-precariousness of the job;
- (b) work in skills-intensive occupations;
- (c) absence of a search for another job.

Employment status

In the EU-27, the employment rates for graduates with a work-based learning experience as part of their highest education attained appear favourable, particularly for those with an apprenticeship experience. For graduates from medium-level vocational education, the EU average employment rate is estimated at 85% for those with an apprenticeship experience and at 76% for those with a traineeship experience. At tertiary level, with employment rates of 89% and 86% respectively, the difference between apprenticeship and traineeship is less pronounced.

Figure 2. **Employment rates of graduates by type of work experiences at their highest education attained (graduates from medium-level vocational education and graduates from tertiary education, aged 20-34 and no longer in formal education), EU-27, 2016**



Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

Graduates with a work-based learning experience as part of their highest education attained in both medium-level vocational education and in tertiary education, particularly those with an apprenticeship experience, tend to have an employment premium (higher employment rate) compared to graduates without work experience during their highest education. This holds in most countries and in the EU-27 on average. The EU average employment rate of graduates who undertook a traineeship is 5% higher than that for those with no work experience in medium-level vocational education and 6% higher in tertiary education. The average employment rate of graduates who did an apprenticeship is 14% higher than that for those with no work experience in medium-level vocational education and 9% higher in tertiary education. No country demonstrated an employment penalty (lower employment rate) for graduates with an apprenticeships experience. A considerable employment penalty is found for vocational medium-level education graduates with a traineeship experience in Greece, Hungary and Romania; the same is true of tertiary education graduates with such a WBL experience in Croatia.

Work experience can occur not only as part of the highest education attained (apprenticeship or traineeship) but also outside of it. Graduates with a work experience, even if outside the curriculum, also tend to have a higher employment rate compared to graduates with no work experience. They even tend to have higher employment rates compared to graduates with a work-based learning experience occurring as part of their highest education (average results for

apprenticeship and traineeship combined), but differences are not great in medium-level vocational education and in tertiary education. This is assessed to confirm the importance of a work experience during studies and therefore the importance of work-based learning as part of the studies (in the form of apprenticeships or traineeships) as a policy actionable option which can support the occurrence of that experience.

Stability of employment

Non-precarious (stable) employment is defined as having a working contract of three months or more. The vast majority of those with a work-based learning experience and in employment are found to be in a non-precarious job. In the EU as whole, employed graduates from medium-level vocational education with an apprenticeship experience are found to be in non-precarious work (98%) slightly more often than traineeship graduates (94%). Overall, 97% of graduates from tertiary education are estimated to be employed in non-precarious jobs, with negligible differences based on the type of work experience at highest level of education.

In most countries, and in the EU-27 on average, there is no considerable difference in non-precariousness (stability) of employment between graduates who had a traineeship or apprenticeship experience and those who had no work experience during studies. This holds for graduates from both medium-level vocational education and for graduates from tertiary education. Based on descriptive evidence, stability of employment does not seem to be affected by work-based learning experiences as part of the highest education attained.

Work in occupations with high skills intensity

Occupations with high skills intensity are defined as those belonging to the first three major international standard classification of occupations (ISCO-08) occupational groups:

- (a) managers;
- (b) professionals and technicians;
- (c) associates professionals and technicians.

In the EU-27 as a whole, the share of graduates from medium-level vocational education in employment working in a highly skilled job was estimated at 23% for those with an apprenticeship experience and slightly lower (at 18%) for those with a traineeship experience. The same pattern was identified in the EU average results for graduates from tertiary education, where the share working in a highly skilled job was estimated at 78% in the subgroup of those with an apprenticeship background and 73% in the subgroup of those with a traineeship background.

Based on average descriptive results, no considerable difference in the share of graduates working in high-skilled jobs was identified between graduates with a traineeship experience and those with no work experience during their highest studies. This holds for graduates from both medium-level vocational education and from tertiary education. But a considerable average difference was identified between those with an apprenticeship experience and those with no work experience during their highest education, by 6% for medium-level vocational graduates and 8% for tertiary graduates. Descriptive findings for the EU as whole, indicate that the share of employed graduates having had an apprenticeship experience and working in more skills-intensive jobs tends to be higher than those without any work experience during education (with slight but worthy of note differences) . On average, less structured experiences in the form of a traineeship do not combine with differences of a considerable magnitude. This holds for graduates from medium-level vocational education and also for graduates from tertiary education. However, the EU-27 average is based on highly dispersed country findings, with considerable differences between countries.

Not looking for another job

The report also analyses the share of employed graduates who are not looking for another job as an indicator of job satisfaction. In medium-level vocational education, 94% of graduates with a traineeship and 96% of graduates with an apprenticeship are not looking for another job (EU-27 averages calculated for those in employment). It was estimated that 93% of tertiary education graduates with a traineeship experience are not looking for another job (same EU-27 average value for those with an apprenticeship).

In medium-level vocational education, in most countries and in the EU-27 as a whole, the difference in the share of employed graduates who are not looking for another job does not differ greatly between those with a work-based learning experience and those with no work experience during their studies. In eight countries (Estonia, Spain, Croatia, Italy, Cyprus, Malta, Portugal and Finland) the analysis found that traineeship graduates reported looking for another job more often than graduates with no work experience (relative difference of more than 2.5%).

At tertiary education level, traineeship and apprenticeship graduates look for another job less frequently than graduates with no work experience in the EU-27 as a whole, but differences are also very small. Results differ across countries, particularly for tertiary graduates with an apprenticeship experience.

Overall, in the EU, most employed graduates with work-based learning experiences are estimated not to be looking for another job. However, no

significant differences are found compared with their counterparts without such experiences. This holds in the EU as a whole for graduates from medium-level vocational education as well as for graduates from tertiary education. Based on descriptive findings, a work-based learning experience does not generate considerable differences in the EU aggregated data for this specific outcome.

Labour market outcomes: multivariate analysis

Multivariate analysis was used to check the robustness of the descriptive results, focusing on two labour market outcomes: the odds of being employed (versus being unemployed) and the odds of having a work contract longer than three months (versus having a work contract of less than three months) as a measure of employment stability. The analysis investigates the relationship between work-based learning as part of the highest level of educational attainment and each of these two outcomes, controlling for several sociodemographic background variables. The key distinction here is between those who had work-based learning experiences (either in the form of an apprenticeship or traineeship experience) as part of their highest education attained and those who had not. The group for comparisons (those without it) comprises two subgroups: those without any work experience during their highest education and those who had work experience during it (but this was outside and not part of the education). The choice is motivated by the policy relevance of the distinction with education policies.

The multivariate analysis pooling data for the EU-27 Member States, the United Kingdom and Iceland, Norway and Switzerland show that, even when controlling for sociodemographic characteristics, graduates from medium-level vocational education with work-based learning have a statistically significant higher likelihood of being employed compared to medium-level VET graduates without work-based learning experience. They are also significantly more likely to be employed compared to medium-level general education graduates. Tertiary education graduates with work-based learning experience also have a statistically significant higher likelihood of being employed compared to their counterparts without such experience. At country level, the same results were found for some countries but not all.

The analysis confirms that, even when controlling for sociodemographic characteristics, there is no statistically significant difference in the likelihood of being employed in a stable job (a contract of more than three months duration) between those who had a work-based learning experience as part of their highest level of education and those who had not. The results hold for graduates from

medium-level vocational education and tertiary education graduates; findings at country level are similar.

Implications for policy and research

The report results clearly indicate considerable diversity in Europe in the prevalence of work-based learning, the profile of graduates who experienced it, and the impact of work-based learning on labour market outcomes. Nevertheless, several main conclusions can be drawn from the research findings.

First, the report shows that work-based learning is more common than might be expected based on established knowledge derived from traditional data sources such as the annual joint UNESCO-OECD-Eurostat data collection on formal education. The report finds that, in the EU-27, almost two thirds of young graduates with a medium-level vocational qualification as their highest educational attainment experienced work-based learning as part of those studies. Additionally, almost half of tertiary education graduates have undertaken work-based learning as part of their studies. This outlines prevalence levels far above those which are typically obtained from the UOE data collection (with fewer than 30% of students in medium-level vocational education being enrolled in combined work- and school-based programmes in the EU). The methodology and the definitions adopted in the 2016 ad hoc module of the EU labour force surveys were piloted on that occasion. They can, and they certainly should be, improved in future. But, despite possible limitations, they reveal higher levels of work-based learning, offering a new perspective on the effectiveness of the efforts undertaken over the past year by countries and the EU to increase this aspect of initial education and to make it a structural feature of formal education systems; this should include, but not be limited to, efforts to increase apprenticeship take-up and quality.

Second, the study finds a positive association between the experience of work-based learning and employment status of youngsters. In most countries and the EU-27 on average, graduates who had some work-based learning in the form of an apprenticeship or of a traineeship experience, have higher employment rates than graduates without work experience during their studies. A strong employment premium was found particularly for graduates with an apprenticeship experience. The results of the multilevel logistic regression analyses confirmed that, overall in Europe, graduates with work-based learning experiences are significantly more likely to be employed than their counterparts without. But such results should be qualified.

On the one hand, the descriptive findings of the report show that employment levels are favourable not only for graduates with a work-based learning experience

as part of their studies but also for graduates with a work experience during (but outside) their studies. While it is reasonable to argue that it is the work experience that makes a difference to the chance of being employed, work-based learning as part of the education is an option which can be more easily influenced by education policies. The past and renewed emphasis that European policies have placed on the importance of work-based learning appears well grounded and justified.

While work-based learning is found to be associated with higher graduate employment, the report does not find that this happens in a systematic and uniform manner across all countries and it does not find that results of the multivariate analysis are statistically significant in all countries. Findings should be interpreted considering that the absolute and comparative employment levels of graduates with a work-based learning experience are affected by several country-specific factors, such as general macroeconomic conditions, labour market settings, stakeholder commitment and cooperation, as well as the quality of work-based learning and education. The commitment to quality work-based learning remains important for education policies.

The positive association between the employment status of young graduates and the experience of work-based learning as part of their studies suggests that the latter is valuable in easing transitions from education to the world of work. It does not mean that such an association continues to hold at older ages, for which lifelong learning remains essential. It also does not mean that work-based learning is a silver bullet to reduce youth unemployment. It can, however, be a useful and beneficial element within a wider set of initiatives.

The relationship between work-based learning and quality of employment appears to be considerably less straightforward. For stability (non-precariousness) of employment, results show that the education level is more influential than having had a work-based learning experience. For job skills intensity, the findings of the descriptive analysis suggest that, in the EU as whole, the share of graduates in high-skilled jobs is higher for graduates with an apprenticeship experience than for graduates without work experience during their studies; however, less structured experience in the form of a traineeship does not result in differences of a remarkable magnitude. The share of graduates looking for another job is, on average, similar across different educational backgrounds. The analysis suggests work-based learning is associated with higher employment rates and chances, but it does not find evidence that it leads to employment in better-quality jobs.

It is important to continue collecting data on work-based learning. It might be possible to improve and simplify the approach adopted in the 2016 ad hoc module of the EU-LFS and – ideally – to start implementing it on a regular and more frequent basis as part of the core (annual or biannual) section of the EU-LFS.

There are also opportunities to develop the multivariate analysis further, for instance by considering alternative labour market outcome variables. The analysis could also be methodologically refined by considering characteristics of education systems, labour market context and macroeconomic conditions and ideally other variables characterising the quality of the work-based learning experience. This would help identify conditions where work-based learning leads to favourable outcomes: such information has the potential to strengthen the evidence base for VET and skills policy.

CHAPTER 1.

Introduction

1.1. Aim, scope and structure of this study

This report focuses on work-based learning (WBL) in formal initial education and training. It aims to provide EU wide updated statistical evidence on its prevalence, sociodemographic profiling and labour market outcomes, essentially answering questions on how many young graduates experienced work-based learning as part of their highest education attained, who they are and how well they do on the labour market.

The report is based on data from Eurostat. It analyses the dataset originating from the 2016 ad hoc module (2016 AHM) of the EU labour force survey (EU-LFS), which covered the topic of young people on the labour market. The report covers the 27 Member States of the European Union, the United Kingdom and three European Free Trade Association (EFTA) countries (Iceland, Norway and Switzerland). Data are internationally comparable and, at the time of writing, the most recent ones available. They are subject to the methodological apparatus of the EU-LFS and of the 2016 AHM. Responsibility for all conclusions drawn from the data lies entirely with the authors of the report.

The analysis focuses on graduates who had work-based learning curricular experiences as part of their highest level of education attained. Particular attention is devoted to graduates from medium-level vocational education and from tertiary education with work-based learning experiences as part of their highest level of education.

The analysis aims to provide statistical evidence on their prevalence (how many they are), their profile (their sociodemographic characteristics) and their labour market outcomes (how well they are positioned on the labour market at the time of the interview after completion of their highest education). The report adopts a comparative perspective across different levels and types of education as well as across different countries. The analysis is restricted to young individuals (aged 20 to 34) who were no longer in further formal education and it makes use of both descriptive and multivariate statistics.

The report is structured into five main chapters. Chapter 1 serves as an introduction to the concept of work-based learning. Chapter 2 discusses data, methodology and limitations of the study. Chapter 3 focuses on the quantification of levels and patterns in the experience of work-based learning. The prevalence of work-based learning in the context of graduates' highest level of education is

quantified and is further qualified with information on the profile of graduates. Chapter 4 provides selected descriptive statistics to describe and quantify a number of key labour market outcomes of work-based learning, including employment rates and various dimensions of quality of employment. Chapter 5 contains a multivariate analysis of two selected employment outcomes to examine, in a more robust way, the relationship between the experience of work-based learning on employment and job stability, while controlling for other possible intervening factors related to the sociodemographic profile. A discussion of key findings, including policy and research implications, is in the conclusions (Chapter 6).

1.2. Towards a common understanding of work-based learning

Cedefop has traditionally defined work-based learning as ‘acquisition of knowledge and skills through carrying out – and reflecting on – tasks in a vocational context, either at the workplace (such as alternance training) or in a vocational education and training (VET) institution’ (Cedefop, 2014, pp. 293-294).

This is not the only definition available. Comyn and Brewer (2018, p. 3) provide an interesting overview of definitions adopted at international level. *Inter alia*, work-based learning has also been referred to as learning that takes place through some combination of observing, undertaking and reflecting on productive work in real workplace (Kis, 2016, p. 7) or as a set of learning practices that differ from those that are classroom- or school-based and which take place in a real work environment, through participation in, and/or observation of, work under the supervision of an employer (Musset, 2019, p. 9).

Definitions of work-based learning have traditionally focused on learning in a real working environment and on learning in conjunction with practice, acknowledging that work-based learning may also combine with traditional classroom learning and e-learning and that the extent of the work-based activity may range from a high to a low intensity, depending on the specific form of WBL considered (ETF, 2013).

More coordinated work on an internationally agreed understanding of work-based learning has progressed in the context of the Interagency Group on Technical and Vocational Education and Training (IAG-TVET) (Cedefop, European Commission, European Training Foundation, International Labour Organization, Organisation for Economic Cooperation and Development, UNESCO). An agreement was found on the ideas that (IAG-TVET, 2016, p. 2):

- (a) work-based learning ‘refers to all forms of learning that takes place in a real work environment’;
- (b) work-based learning ‘usually – but not always – combines elements of learning in the workplace with classroom-based learning’;
- (c) the most common types of work-based learning are apprenticeships, internships/traineeships and on-the-job training.

It is evident from the definition that the general concept of work-based learning encompasses a number of formal, non-formal and informal learning activities, belonging to (or combining with) both initial and continuing education and training. While most countries principally aim at offering more training opportunities for young people, work-based learning schemes open up to offer training opportunities for adults, to support their reintegration into the labour market or their upskilling.

Definition issues are no smaller when it comes to the different typologies of work-based learning in initial education and training. This reflects the heterogeneity and, to some extent, the dynamic of work-based learning settings across and within EU countries. For instance, evidence from Cedefop analysis (2018a) shows that today there are different interpretations of apprenticeships, even in the same national context, and that there are trends to change and adapt apprenticeship functions.

This report focuses on work-based learning in formal initial education and training, including apprenticeships and traineeship schemes, and excluding other types of on-the-job training for employees. It does so using definitions and operationalisations of the concepts adopted for statistical purposes in the context of the 2016 ad hoc module of the EU labour force survey. Chapter 2 presents detailed methodological information.

1.3. Work-based learning in European policies

Work-based learning has risen rapidly in the policy agenda over recent years, particularly in the European Union. Efforts to strengthen work-based learning in vocational education are increasingly common throughout European countries, as these countries seek to improve the skills and employability of young people.

However, work-based learning has a long tradition as a policy priority at European level and several policy initiatives have been undertaken at this level to promote work-based learning in the pre- and post-2020 policy cycle.

Already in the Bruges communiqué on enhanced European cooperation in vocational education and training (VET) for the period 2011-20, Member States and social partners committed themselves to the inclusion of work-based learning

in initial VET, to make it a feature of all initial VET programmes and even to maximise its contribution to the expansion of apprenticeships. The Bruges communiqué stressed that ‘work-based learning is a way for people to develop their potential. The work-based component contributes substantially to developing a professional identity and can boost the self-esteem of those who might otherwise see themselves as failures. Learning on the job enables those in employment to develop their potential whilst maintaining their earnings’ (Council of the European Union and European Commission, 2010, p. 4).

In February 2013, the European Commission established a European Alliance for Apprenticeships (EaFA). The aim of this alliance was to strengthen the quality, supply, image and mobility of apprenticeships in Europe. It brings together governments and other key stakeholders, such as business associations, individual companies, social partners, chambers, VET providers, regions, youth representatives and think tanks.

European VET ministers further underlined the increasing need to promote work-based learning in all its forms in the Riga conclusions (European Commission, 2015a). The EU Member States, the candidate countries, the European social partners and the European Commission agreed on a new set of five medium-term deliverables for the period 2015-20 (European Commission, 2015a). The first of these deliverables focuses on work-based learning in VET: ‘Promote work-based learning in all its forms, with special attention to apprenticeships, by involving social partners, companies, chambers and VET providers, as well as by stimulating innovation and entrepreneurship’ (European Commission, 2015a, p. 4).

The Riga conclusions included the following concrete policy options:

- (a) mobilising initiatives at national level to boost the share of WBL in VET programmes, in both school-based programmes and those combining learning in schools and enterprises, as appropriate;
- (b) mobilising actions to strengthen, review or introduce apprenticeships in the context of the European Alliance for Apprenticeships, and integration of apprenticeships provided under youth guarantees in national VET systems;
- (c) creating a clear regulatory framework for work-based learning, taking into account existing regulations, industrial relations and education practices;
- (d) setting up and enhancing institutionalised intermediary support structures with the involvement of chambers, business and sector organisations to manage administration related to work-based learning in companies;
- (e) assisting VET providers in finding training places for trainees and VET teachers and trainers in enterprises, and supporting small and medium-sized enterprises in providing apprenticeship places (including through incentives).

The initiatives to promote WBL were part of wider activity at EU level, aimed at improving education and training, youth employment, and social inclusion; these included the EU agenda for job growth, fairness and democratic change, the youth employment package, and the broader European Union youth strategy (2010-18). In these, work-based learning is central to the Commission's renewed effort to improve the prospects for young people to enter the labour market. Work-based learning is explicitly mentioned in the *Youth guarantee* (Council of the European Union, 2013), where all Member States commit to 'ensure that all young people under the age of 25 years receive a quality offer of employment, continued education, an apprenticeship or a traineeship within four months of becoming unemployed or leaving formal education' (Council of the European Union, 2013, p. 3). The reports *Continued education offers under the Youth guarantee: experience from the ground* (European Commission, 2018a) and *Traineeships under the Youth guarantee* (European Commission, 2018b) both stressed the importance of work-based learning as a way to increase the employability of (at-risk) youth.

WBL policies have been aligned with documents, such as the 2015 employment guidelines, which identified the effectiveness and efficiency of education and training systems as essential in raising the skill levels of the workforce. In turn, they are central in adapting to changes in the labour market (Council of the European Union, 2015).

In the new skills agenda for Europe, the European Commission proposed that VET should include a strong-work-based dimension and that social and business partners should be involved in its design and delivery (European Commission, 2016). In October 2017, the Council of the European Union adopted a recommendation envisaging a European framework for quality and effective apprenticeships (Council of the European Union, 2018). This is in line with the European Pillar of Social Rights, which defends the right to quality and inclusive education, training and lifelong learning.

Such an approach has been continued and further reinforced in the post-2020 EU policy cycle. At the time of writing, this resulted from *The European skills agenda for sustainable competitiveness, social fairness and resilience* (European Commission, 2020), the *Council recommendation on a bridge to jobs* (Council of the European Union 2020a) and the *Council recommendation on VET* (Council of the European Union, 2020b).

In this new context, the objective was confirmed to increase the availability of (and exposure to) work-based learning opportunities with a view to increasing its prevalence and even to establishing quantitative targets. A reinforced European Alliance for Apprenticeships is envisaged, which will mobilise new pledges to

sustain apprenticeship offers and to develop apprenticeship programmes, even in an unfavourable economic context. The European Commission is expected to mobilise resources to support a set of national actions, also covering direct subsidies for apprentices in small and medium-sized enterprises (SMEs), for providing a stable supply of quality and effective apprenticeships. Investment in intercompany training centres, for tailored staff training, will be incentivised, devoting particular attention to linkages with smart specialisation strategies and/or regional innovation and growth strategies. The renewed alliance will attribute particular importance to apprenticeships in the transition to a greener and more digital economy. A scenario is outlined for increasing commitment to quality and effective apprenticeships, involving and mobilising local and regional authorities as catalysts for apprenticeships, strengthening dialogue among social partners, including at sectoral level, and dealing with the issues of placement of apprentices from insolvent companies.

1.4. **Work-based learning and labour market outcomes: related literature**

Work-based learning programmes in initial formal education and training are considered to have positive effects for graduates, employers, VET providers, labour markets, economies and societies at large (Cedefop, 2011; European Commission 2012; European Commission, 2013a; ETF, 2013). They particularly aid transitions from education to work and contribute to the development of relevant skills for the labour market.

Such a vision is supported and qualified by a wide literature detailing benefits for learners and graduates. Section 1.4 provides a summary, taking the specific perspective of labour market outcomes.

A number of studies have showed the merits of work-based learning for providing labour market relevant knowledge, skills and competences, of technical, transversal, occupational, job- or company-specific nature (Billett, 2001; Darche et al., 2009; Fuller and Unwin, 2008; Field et al., 2009). In this context, knowledge and work-experience are accumulated which underlie and promote not only the development of technical skills but also of transversal skills (such as communication, teamwork and customer relations) as well as positive work behaviours, such as taking responsibility, respecting disciplines, meeting deadlines and knowing how to act in a given situation (ETF, 2013). This occurs for various reasons, including because learners experience working methods and work requirements of actual workplaces at an early stage (Ryan, 2011).

The development of these skills and the materialisation of positive labour market outcomes are possible if appropriate conditions are met. One such is that work-based learning takes place within favourable, conducive and supportive learning contexts at firm and system level. Examples include dynamic labour markets characterised by adequate and qualified demand for labour and skills; coordination and commitment of all stakeholders involved towards skills development through work-based learning, high-end human resources practices in firms, adequate provision of key competences in the school-based component of formal programmes, and absence of opportunistic behaviours aimed at substituting labour in standard employment with cheaper types. Some authors stress that learning and outcomes are subject to important variations according to the different situations learners are exposed to and the support they receive (Stasz and Kaganoff, 1997).

When conditions are met, labour market outcomes for young graduates tend to be documented as favourable, at least the short term and particularly for employment levels.

In France, Arrighi and Brochier (2009) observed an employment premium for former apprentices compared to other types of graduate, subject to considerable sectoral variations within three years of completion. In the United Kingdom, apprentices were estimated to have a higher probability of being in full-time employment (McIntosh, 2004; McIntosh, 2007), being more likely to hold management, foreman or supervisory positions (Perez-del-Aguila et al., 2006) and feeling more prepared for the labour market compared to their counterparts (Unwin and Wellington, 2001).

Recent studies point out that work-based learning in vocational education and training provides important benefits for graduates. A review article by Haruna and Kamin (2019) revealed that WBL in VET is beneficial for the employability of participating students. Similar effects have been reported for higher-education students participating in WBL programmes (Major, 2016). Black et al. (2012) showed that work-based learning programmes lower the likelihood of school dropout and ease the transition from education to the labour market. Bonnal et al. (2002) found that, in France, apprenticeship was related to a significant short-term wage premium over alternative forms of VET. More recent research has shown that students with in-school work experiences earn more in their first years of employment than students who did not participate in traineeships or apprenticeships (Cabus and Haelermans, 2017; Staff and Mortimer, 2008).

Some authors have found that, compared to their counterparts, the initial employment premium VET graduates tend to enjoy, including and particularly those from work-based programmes, may shrink or even disappear at older ages.

The line of argumentation is that the high specificity of the skills initially developed (occupational-, job- and company-specific skills) expose them to the risk of being less adaptable to changes in technologies, organisations, employers, jobs or careers. (Hanushek et al., 2011; Forster et al., 2016; Acemoglu and Pischke, 1998). On a similar line, some authors argue that, although development of cognitive transversal skills can and do occur in programmes with a work-based component, based on empirical evidence, they challenge the idea that this can achieve the same results obtained with other types of education and training (Hughes et al., 1999; Nijhof and Nieuwenhuis, 2008), which devote more specific learning time to this end.

To date, there are only a limited number of studies that have investigated the association between work-based learning and labour market outcomes from a European-comparative perspective; these already date back some years. Ryan (2001), making use of cross-country evidence, argues that vocational work-based learning, particularly apprenticeships, increase the chances of an early working life and carry a modest income premium. Gangl (2003), by compiling a series of integrated comparative empirical analyses, found that, at medium education level, work-based learning in the form of apprenticeship offers advantages particularly with respect to youth unemployment. Wolbers (2005), based on data for 2000, analysed speed, quality and stability of graduate transitions to the labour market, finding cross-country variations. Piopiunik and Ryan (2012) present, discuss and qualify possible benefits of work-based learning, specifically apprenticeships, for the young and systems, based on available empirical evidence in various countries; they also discuss methodological limitations which should be kept in mind when assessing its robustness. Cedefop (2013), based on 2009 LFS data, found that, among young people with a VET qualification in Europe, the probability of being employed is significantly higher for those graduating from work-based programmes, relative to those graduating from school-based programmes. In these works, contextual factors related to national characteristics of labour markets and to the education and training systems are often mentioned as important in shaping the role of work-based learning in aid transitions to (and/or outcomes in) the labour market.

1.5. Work-based learning and data availability in Europe

Despite the high policy and research relevance, the availability of internationally comparable data on prevalence and outcomes of work-based learning is limited; this, in turn, has limited the number of studies at this level.

The key source of regular and internationally comparable statistical information is the joint UNESCO, Organisation for Economic Cooperation and Development (OECD) and Eurostat (UOE) data collection on formal education (UOE, 2016). In the UOE context, a vocational programme is classified as combined work- and school-based if 25% or more of the curriculum is presented outside the school environment; otherwise, it is classified as school-based. Programmes where the work-based component accounts for 90% or more of the curriculum are excluded.

This source has considerable methodological limitations for the aim of this report. In absence of an internationally agreed definition of vocational programmes at levels 6 and above of the international standard classification of education (ISCED 2011), information on combined work and school-based programmes is collected only for ISCED education levels 3, 4 and 5. Also, the 25% threshold does not allow capture of important nuances in the provision of the work-based component, which characterise national systems and their recent reforms ⁽¹⁾. And data are collected only on the number of students, with information on graduations and outcomes outside of the scope.

To illustrate both current knowledge and related methodological limitations, a snapshot of recent data is provided in Figure 3. Students in formal programmes combining work- and school-based education were estimated to account for 26.9% of all VET students in the EU (data refer to upper secondary and post-secondary non-tertiary level of education, ISCED 2011, levels 3 and 4). Large cross-country variations emerge. In Denmark, Ireland, Latvia and Hungary, almost all initial VET (IVET) students participate in combined work- and school-based programmes. Considerable proportions were also estimated for Germany and Austria. However, the data do not allow capture of recent development in system settings ⁽²⁾. The UOE methodological distinction of combined work- and school-based programmes, as opposed to mainly or solely school-based programmes, is reported as not applicable in CZ, HR, IT, CY, LT, PT, SI. Data do not support an investigation of the outcomes.

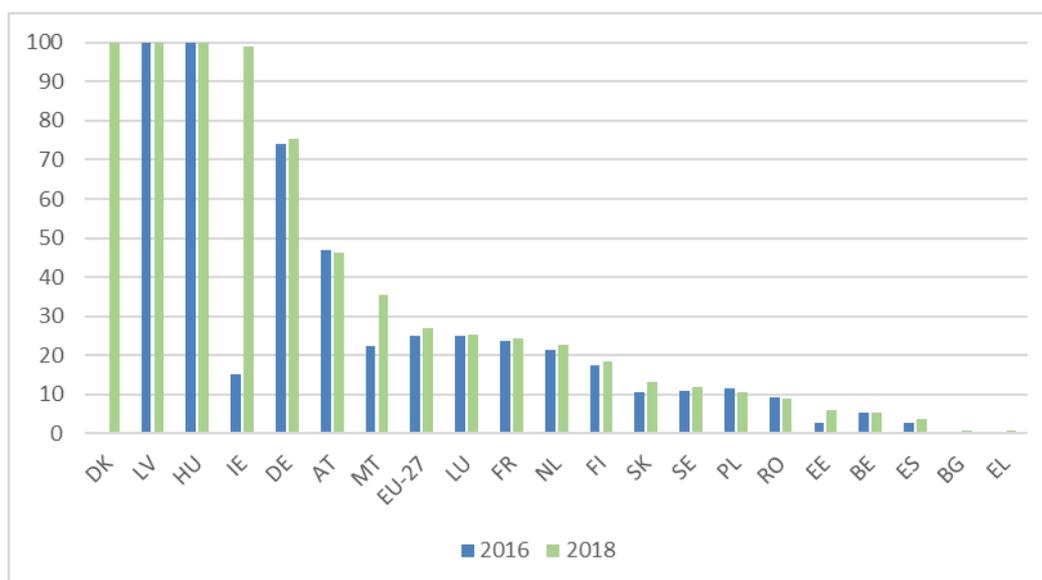
⁽¹⁾ Under the UOE methodological framework, if a vocational programme is classified as combining work- and school-based elements, and if a student is enrolled in this kind of programme, s/he is counted as in work-based learning. If, however, a student experiences a shorter work-based learning experience, s/he should not be theoretically counted. If a student has a work-based learning experience of any duration, on an optional and individual basis, as part of a programme typically pre-classified as school-based, s/he should not be theoretically counted either.

⁽²⁾ For instance, in Italy, based on Law No 107 of 2015, a compulsory work-based component was introduced in both general and vocational programmes, of respectively 200 and 400 hours in the final years of upper secondary programmes, which do not emerge from UOE data.

In an attempt to overcome these limitations, at least partly, the new EU labour force survey, which will result from the Integrated European social statistics framework regulation and its implementation, will introduce a new variable which will indicate if and how the highest level of an individual's education included work-based learning experiences (with distinctions based on duration and remuneration of that experience). Such developments will materialise in 2021 or 2022 and related data are not collected at the moment.

However, the 2016 ad hoc module of the EU-LFS on the situation of young people in the labour market was used as a test for such an approach and data have been already collected (European Commission, 2015b). The ad hoc module included a number of additional variables, some aimed at better and differently characterising the educational background of young people in a work-based learning perspective. This report makes use of these variables in combination with others typically collected in the EU-LFS to investigate prevalence and outcomes of work-based learning. It intends to satisfy unmet demand for updated data of this kind.

Figure 3. **Students in combined work- and school-based vocational programmes (% of all students in vocational programmes at upper secondary and post-secondary non-tertiary education level) (ISCED 3-4)**



NB: Data for NL are estimated based on students in public institutions only. The UOE methodological distinction of combined work- and school-based programmes as opposed to mainly or solely school-based programmes is reported as not applicable in CZ, HR, IT, CY, LT, PT, SI.

Source: Own calculations based on Eurostat, UOE data collection on formal education.

CHAPTER 2.

Definitions, data, methods and limitations

2.1. Definition of work-based learning

In this report, following the methodology adopted for the 2016 ad hoc module of the EU labour force survey, the concept of work-based learning is operationally defined, for statistical purposes, as work experiences which occurred as part of curricular studies at the highest level of formal education attained.

Whenever possible, the report further distinguishes between two main categories of work-based learning: apprenticeships and traineeships. The methodology of the 2016 ad hoc module of the EU labour force survey, on which the report is based, abstracts from national definitions and regulations.

In this context, an apprenticeship is defined as work experience occurring as part of the curriculum of the highest level of formal education attained, whereby all of the following characteristics are combined:

- (a) it is a mandatory part of the curriculum;
- (b) it lasts six months or more;
- (c) it is paid (Eurostat operational definition for the 2016 ad hoc module) (European Commission, 2015b; European Commission and Eurostat, 2016).

Traineeship is defined as a work experience occurring as part of the curriculum of the highest level of education and missing at least one of the above characteristics. In this sense, apprenticeship, compared to traineeship, is to be understood as a more intense and more structured work-based learning experience characterised by remuneration, longer duration and compulsory nature in the context of curricular studies. In the report, work-based learning is defined as either apprenticeship or traineeship as above. Results should be interpreted accordingly.

Traineeships and apprenticeships are the most common types of curriculum-based, work-based learning experiences (European Commission, 2013b; IAG-TVET, 2016). The distinction between traineeships and apprenticeships is not based on programme names, job contracts or qualifications attained, in order to abstract from country-specific terminologies, regulations and understanding of the concept.

The definition of apprenticeship used for the 2016 ad hoc module, and also in this report, is different from that used in the core labour force survey (European Commission and Eurostat, 2016, p. 6), but it was deemed more appropriate to relate it to formal education and qualifications.

The 2016 ad hoc module offers the possibility to distinguish further between mandatory and voluntary traineeships. For ease of analysis and presentation, as well as to overcome some data issues that emerged as part of the implementation of the module, this distinction is dropped and traineeships are considered together, without further distinction.

Information on work-based learning was obtained from two of the 11 variables of the 2016 ad hoc module (WORXEXP and WORK STUD) which were used to capture work-based learning and its subcategories at the highest level of education attained.

WORXEXP and WORSTUD were used to identify the following information on individuals in the sample:

- (a) if they had work experience during their studies at the highest level of education or not;
- (b) if such experiences were part of the curriculum or not and, if so, whether they were a mandatory part of it;
- (c) if such experiences were paid or not;
- (d) if such experiences were less than six months or had a longer duration.

In the 2016 ad hoc module of the EU labour force survey, and in the report, information on work-based learning is available only when occurring as part of the highest level of education attained. Information on the highest educational attainment is coded on the basis of the 2011 international standard classification of education (UIS, 2012) and its implementation in the EU-LFS (Eurostat, 2019a).

The analysis makes use of the following main aggregated categories for educational attainment:

- (a) low level of education: at most, lower secondary education (LSE), corresponding to ISCED 2011 level 2 or below ⁽³⁾;
- (b) medium-level education (MLE), corresponding to ISCED 2011 levels 3 and 4, further distinguished in vocational (VOC) and general (GEN) orientation;

⁽³⁾ The group of those with, at most, a lower secondary education (lower secondary education or below), is typically defined with those with an educational attainment at ISCED levels 0, 1 or 2). In this report, the group of those with, at most, a lower secondary education (with lower secondary education or below) is defined, without considerable impact on results, as those with an educational attainment at ISCED level 1 or 2. The reasons for this is that in the 2016 AHM of the EU-LFS, key variables on work-based learning have been declared applicable only to those with an educational attainment at ISCED level 1 and above. Therefore, those with ISCED level 0, a very tiny proportion of the population and of the sample, particularly among young people, have been filtered out from the analysis. Yet, figures are assessed as continuing being representative of those with an educational attainment at ISCED 2 or below.

- (c) tertiary-level education (TLE), corresponding to ISCED 2011 levels 5 to 8, where an internationally agreed distinction of vocational or professional education, as opposed to general or academic, is still missing and therefore not used.

These categories are derived by combining core EU-LFS information from the variables HATLEVEL and HATVOC respectively on level and orientation of the highest educational attainment (Eurostat, 2019a).

In tertiary-level education and in medium-level vocational education, the report considers WBL, and, to the extent possible, its two main typologies (apprenticeship and traineeship). Some key data is also provided on prevalence of work-based learning in medium-level general education and in lower levels of education. In these cases, no further distinctions are considered and the analysis does not expand on them. This is due to confirmed expectations on a considerably smaller magnitude of the phenomenon in the EU, smaller number of observations in the sample and reliability/confidentiality issues for the analysis (Annex 17). Annex 17 also provides more information on classifications and variables used to derive information on work-based learning.

For comparisons and benchmarking, the sections on descriptive statistics (Chapters 3 and 4) also present a selection of data for individuals who had work experiences during their highest level of education attained but which were not part of it and which are not considered WBL (for instance, jobs to accompany or support studies). Unless otherwise specified, the term work experiences at the highest level of education is used in the report to include both WBL experiences in the form of apprenticeships and traineeships (i.e. as part of the curriculum of the highest level of education), and work experience during the highest level of education but outside the curriculum of the related studies.

2.2. Population of interest

The report focuses on young graduates who experienced work-based learning as part of their highest education at both medium and tertiary levels. The analysis is carried out separately, considering young graduates with a qualification at medium level of education as their highest (devoting particular attention to those with a vocational qualification) and young graduates with a tertiary level qualification as their highest. In the report, these are respectively referred to as:

- (a) graduates from medium-level (vocational) education or graduates with a medium-level (vocational) qualification;

- (b) graduates from tertiary-level education or graduates with a tertiary-level qualification.

At these levels, graduates with work-based learning are contrasted and compared with individuals with different levels and types of education. Although the 2016 ad hoc module was administered to young people aged 15 to 34, the analysis in this report is restricted to individuals aged 20 to 34 who were no longer in formal education. This implies a restriction in the number of observations available for analysis, but it aids achieving more meaningful results. This choice allows better investigations of prevalence and labour-market outcomes of work-based learning, including better comparisons across different countries and educational backgrounds by reducing a possible bias in the analysis. This is due to the fact that transition to labour market may not yet be complete for a considerable and variable proportion of (very) young people who are still in formal education. As a consequence, their labour market participation and their employment levels may be reasonably expected to be low. Even when they have a job, this may well be short-term or alongside their studies; for these reasons, they were excluded from the analysis. More detailed information about the consequences of these methodological choices on the results of the analysis are provided in Annex 1.

2.3. Sociodemographic characteristics of graduates

The study uses age, gender, country of birth, marital status and household working status as background sociodemographic variables. These are used to characterise the profile of graduates with work-based learning experiences and/or as control variables in multivariate regression models.

Gender is measured by a categorical variable with two categories, male and female. Age is also operationalised as a categorical variable with three categories:

- (a) 20- to 24-year-olds;
- (b) 25- to 29-year-olds;
- (c) 30- to 34-year-olds.

For country of birth, used as a possible indicative proxy for a migrant background, a distinction is made between those who are native born and those born who are foreign born. Marital status consists of two categories: married and not married (single, divorced or widowed). Household working status measures whether all adults in the household of the respondent are working, or if at least one adult in the household is not working (variable HHWKSTAT). Section 2.5 provides

information on how these variables have been used in the analysis and how they are presented in the report.

2.4. Labour market outcomes

The report explores the relationship between work-based learning as part of the highest level of educational attainment and a set of labour market outcomes. Section 2.4 introduces the information used to look into labour market outcomes.

To describe the labour market outcomes of young graduates statistically, several core variables can be considered. For quality and international availability, those focusing on their current situation on the labour market are typically selected, disregarding the occurrence or not of a previous and significant job, its characteristics and the time needed to obtain it (which are more difficult to capture and summarise and also, to an extent, even less meaningful as they do not cover the following developments and the current situation). There are reasons to expect that the returns to work-based learning may depend on the choice of the variables used to describe the current situation on the labour market. Some authors have found that while vocational education is successful in establishing safe routes into employment (short transitional period, stable employment), these jobs are often of lower status than those obtained through general education (lower earnings, less occupational prestige) (Shavit and Müller, 1998). Hence, a set of variables on various dimensions of employment and its quality are included in the analysis, based on data availability.

The first and primary labour market outcome is the employment status (variable ILOSTAT of the EU-LFS). The ILOSTAT variable in the EU-LFS dataset consists of four categories:

- (a) employed;
- (b) unemployed;
- (c) inactive;
- (d) in compulsory military service.

Those respondents in compulsory military service are excluded from the analyses (n=100 in sample of 20- to 34-year-olds not in formal education). In the analyses, the inactive and unemployed categories are merged and the dichotomous outcome is 'being in employment' as opposed to 'non-being in employment'. The loss of information is minimal as the analysis is generally restricted to those not in formal education and therefore in need of or likely being active and employed on the labour market. The variable assumes a key importance in the context of the debate on transitions to employment.

Several other variables are considered alongside employment status as indicating quality of employment for those who work.

The second labour market outcome considered is the stability or non-precariousness of young graduates' main jobs, as proxied by the duration of their work contract (variable *TEMPDUR* of the EU-LFS). This outcome is necessarily restricted to individuals with a work contract, specifically to employees only. The stability of a job is operationally defined by means of the total duration of it, as per work contract. If the duration of the contract is up to three months, in line with the Eurostat definition, a job is defined as 'precarious'. A duration of more than three months, including permanent contracts for an indefinite period, is categorised as 'non-precarious'. The variable assumes key importance in the context of the current research debate. For some years, full-time open-ended contracts in many western countries have given way to more atypical and flexible forms of employment, such as part-time and temporary employment, which makes it easier for firms to adjust to changing demands and economic fluctuation. Changes in the shares of temporary and part-time jobs have both indicated a long-term upward trend in Europe (Eurostat, 2019b). According to research carried out for the European Parliament in 2016 (European Parliament, 2016), the incidence of standard open-ended, full-time contracts fell from 62% in 2003 to 59% in 2014. A further research study for the European Parliament (European Parliament, 2017a) analysed patterns of job quality across types of employment along the dimensions of working conditions reported by the fifth and sixth EWCS. The study found that full-time and part-time open-ended contracts, as well as the category of self-employed with employees, continue to be associated with a low risk of precariousness, while marginal-part-time work, fixed-term contracts and freelance work had a medium level of precariousness risk; the risk was at its highest and tended to increase for temporary agency workers. Further evidence shows that a particularly high burden is put on the younger generations as they tend to have more difficulties in finding a job and they are more often in non-standard and precarious forms of employment, including temporary contracts (European Parliament, 2017b). The increased use of non-standard job arrangements has raised concern that they are worse for workers than standard permanent and full-time job contracts (Matsaganis et al., 2016). Whether the growth of non-standard employment is problematic depends on the quality of these non-standard jobs (Kalleberg, 2000). There is empirical evidence from different countries regarding the less favourable treatment of temporary and part-time workers compared to permanent and full-time workers in terms of job quality: they often have lower job security, reduced access to both statutory and employer-provided social security

benefits, and disadvantages in access to firm-funded training (e.g. Eurofound, 2002; Graaf-Zijl, 2005; Leschke, 2007).

The third labour market outcome refers to the skills intensity of an individual's main job. In the absence of better variables in the dataset, the study uses information on the occupational group to which a job belongs (international standard classification of occupations (ISCO) 1D in the EU-LFS). Occupational groups are defined according to the international standard classification of occupations (ISCO 08), developed by the International Labour Organization (ILO) ⁽⁴⁾. In the EU-LFS dataset, major occupational groups are considered. A dichotomous variable is constructed from this classification that indicates whether a job belongs to a major occupational group assumed as being characterised by high skills intensity (managers, professionals, technicians and associate professionals). The underlying assumption is that the jobs belonging to the three major groups have a higher skills intensity compared to the others. The assumption is supported by the ISCO conceptual framework which places those three major groups at higher skills levels (3 and 4) compared to others and which describes them as being characterised by more complex tasks, requiring a more extensive body of knowledge, higher skills, studies at higher levels and or experience. The importance of the variable is highlighted by previous Cedefop research. Cedefop's European skills forecasting model projects that by 2025 about 48% of all job opportunities in Europe will need to be filled by individuals with tertiary-level qualifications. Further, it is expected that, on average, labour demand for low-skilled employees will decrease (Cedefop, 2017). This has consequences for lower-skilled employees who risk social exclusion and disengagement from the labour market, and for employers who frequently encounter recruitment bottlenecks due to skills shortages. Four in 10 employers in the EU reported in 2013 that they have difficulty finding the right skills when recruiting (Cedefop, 2018b). Although most of the increases in employment in recent years have been concentrated in higher-skill-level occupations, growth has also occurred in certain lower-level occupations where it is difficult to automate tasks, such as parts of the service sector. Towards 2030, forecasts predict a shift towards more autonomy, less routine, more information and communications technology (ICT), fewer physical tasks, and more social and intellectual tasks (Cedefop and Eurofound, 2018). Although skills and qualifications are often used interchangeably, it is important to note that low educational attainment does not automatically lead to

⁽⁴⁾ The classification was last revised in 2008 (ISCO-08). The LFS uses the revised classification (ISCO-08) since 2011. ISCO is available in the anonymised microdata in a one-digit level of detail (ISCO1D) and a three-digit-version level of detail (ISCO3D). The one-digit version is used in the analysis.

low-skilled jobs. Other factors are involved, such as skills obsolescence (for example due to ageing) and skills mismatch (due to age, sex or nationality) (Cedefop, 2017).

The fourth labour market outcome relates to whether employed individuals are looking for another job or not (LOOKOJ). This is a dichotomous variable that is assumed as providing indications on one's satisfaction with the job currently performed. Ideally, information on reasons why respondents are actually looking for another job would have been beneficial but the sample was too small to differentiate among them.

Other aspects of quality of employment – involuntary temporary and part-time jobs and participation in training – have been considered in the analysis.

Section 2.5 provides methodological information on how outcome variables have been used in the descriptive and multivariate analysis and how they are presented in the report.

An important variable of the 2016 ad hoc module of the EU labour force survey, aimed at measuring the match between the education and the job of employed individuals, has been excluded from the analysis following an unfavourable assessment of its quality (OKLEVEL). This variable was intended to capture for employed individuals the extent to which their highest level of education was appropriate to the needs of their job. The specifications for the variable and its implementation presented a number of issues. The question in the proposed standard questionnaire did not fully match the definition of the variable and its categories; the orientation (general or vocational) of this highest level of education was not in the conceptual scope of the variable, reducing its value. For individuals in education, detailed specifications asked for the education currently attended, creating confusion in terms of purpose, scope and implementation of the variable (Eurostat, 2018a).

2.5. Methods and presentation of results

2.5.1. Descriptive statistics

Chapter 3 provides estimates for the prevalence of work-based learning as part of the highest education attained. The analysis is carried out at EU and country level. Data are complemented by additional information on work-experiences occurring during the highest level of education but not as part of it.

Particular attention is devoted to occurrence of work-based learning for graduates from medium-level vocational education (ISCED levels 3-4) and from tertiary-level educational (ISCED levels 5-8) for whom distinctions and separate

analysis are performed, covering both apprenticeships and traineeship experiences.

Chapter 3 also provides data on the profile of these graduates, according to several sociodemographic characteristics. Results of the analysis on gender, age and country of birth are presented in Chapter 3. Additional results concerning marital status and household working status are presented in Annex 7 and Annex 9.

To characterise their profile further along such dimensions, specific comparisons are carried out with contrast groups according to these variables. The following comparisons are carried out across different figures in Chapter 3:

- (a) figure in which ISCED 3-4 vocational graduates with apprenticeship experiences are compared to those without any work experience during their highest education, but with same broad level and orientation of education;
- (b) figure in which ISCED 3-4 vocational graduates with traineeship experience are compared to those without any work experience during their highest education, but with same broad level and orientation of education;
- (c) figure in which ISCED 5-8 graduates with apprenticeship experience are compared to those without any work experience during their highest education, but with same broad level of education;
- (d) figure in which ISCED 5-8 graduates with traineeship experience are compared to those without any work experience during their highest education, but with the same broad level of education.

The group used for comparisons is made up of graduates who have the same highest educational attainment (broad level or broad level and orientation) and who did not acquire any work experience during their highest education (no participation in WBL in the forms of traineeship or apprenticeship as part of their highest education, no work experience outside the curriculum during their highest education). For ease of writing, these may be referred as graduates with no work experience during education in the text. The absence of work experience is understood as absence of it at their highest education attained (absence as part of or during that education).

The figures in Chapter 3, which present national data for the profile of the graduates, cluster the countries into groups according to over- or underrepresentation. The method is illustrated below, taking gender as an example:

- (a) overrepresentation: if the share of male graduates with a traineeship or apprenticeship type experience exceeds the share of male graduates who did not acquire any work experience by a predefined threshold (of 10% in the case of gender);

- (b) underrepresentation: if the share of graduates with a traineeship or apprenticeship experience falls behind the share of male graduates who did not acquire any work experience by a predefined threshold (of 10% in the case of gender);
- (c) similar representation: if the share of male graduates from traineeships or apprenticeships does not exceed or falls behind the share of male graduates who did not acquire any work experience by a predefined threshold (of 10% in the case of gender).

The overrepresentation/underrepresentation levels are calculated from the relative percent difference between traineeship/apprenticeship graduates and graduates with no work experience. The relative difference is calculated by dividing the difference between the shares of these two groups of graduates by the share among traineeship/apprenticeship graduates. The thresholds are predefined based on authors' assessment, typically set at 10%, and kept constant unless otherwise stated.

If there are no (reliable) data for graduates with traineeship or apprenticeship experiences, or for graduates who did not acquire any work experience during the highest education attained, this is indicated by the flag :(u) in the figures, and countries are clustered accordingly. Some countries reported low response rates on questions used to derive the presence/absence of experience of work-based learning at the highest educational attainment (Czechia and Germany, see Section 2.6.2). This group is indicated by the flag (a) in the figures. Below each figure, an overview of the flagged values for each country is provided. The underlying data for the figures are presented in tables in the annexes.

Chapter 4 uses descriptive statistics to look into labour market outcomes. Particular attention is devoted to labour market outcomes of graduates with work-based learning as part of medium-level vocational education (ISCED levels 3-4) and as part of tertiary-level education (ISCED levels 5-8) for whom distinctions and separate analysis are performed covering both apprenticeship and traineeship experiences.

The descriptive analysis of outcomes considers the following outcome variables:

- (a) employment;
- (b) stability or non-precariousness of the job;
- (c) looking for another job;
- (d) skills intensity of the job.

Additional complementary information is made available in a descriptive way on variables measuring involuntary part-time work and involuntary temporary work (as possible measures of quality of employment) as well as on participation in

training (supporting graduates' skills development and adaptability to change). This is done in Annex 14.

To characterise the labour market outcomes of these graduates further along such dimensions, a methodology similar to that used for their profiling is used. The same type of comparison is carried out with a view to identifying premia or penalties in labour market outcomes for graduates with work-based learning experiences as part of their education.

2.5.2. Multivariate analyses

Chapter 5 of this report comprises the results of multivariate analysis on the odds of two selected outcome variables:

- (a) being employed (versus being unemployed);
- (b) the odds of having a work permanent contract or one longer than three months (versus having a work contract of less than three months).

In the models, the outcome variables are the dependent ones. The two outcomes have been selected based on their importance in the policy and research debate.

In the multivariate analyses, the effect of work-based learning by highest education is controlled for a number of sociodemographic background variables.

The analysis has been carried out in two steps. In the first step, a multilevel logistic regression analysis has been performed for the EU sample as a whole. In a second step, country-specific logistic regression analysis has been performed to reveal country-specific relationships.

In the first step, the multilevel logistic regression analysis has been privileged because, in the EU-LFS, data have a clear multilevel structure, as the respondents are clustered within countries and it is difficult to assume complete independence of observations.

The multilevel logistic regression analyses have a stepped structure. In a first step, a null model is estimated; this is a model in which no independent variable is included and only the intercept is allowed to vary between countries. This model is used to calculate the intraclass correlation (ICC) which presents the proportion of the variance of the dependent variable that is situated at the country level. The higher the ICC, the more important country-level variables are to explain the outcome variable. The second model is a random intercept model, in which the variables on educational attainment and work-based learning are included. In the third model, the sociodemographic variables are added into the analysis. The multilevel logistic regression estimates are calculated for each model, including the standard errors, the odds ratios and fit statistics (AIC, BIC and -2LL).

In addition to the multilevel logistic regression analyses, separate logistic regression analysis has been performed for each country. These models also follow the stepped structure: first the role of work-based learning by educational attainment is analysed without the sociodemographic variables, and then the sociodemographic variables are added to the model. The logistic regression estimates, the standard errors, the odds ratios and fit statistics for each model are presented in the Annex. The main findings of the country-level analysis are summarised in tables in the main text of the report.

The main independent variables of interest in the (multilevel) logistic regression analyses combine information on the highest level of educational attainment, its orientation (where applicable, i.e. ISCED level 3-4) and its work-based nature. Table 1 shows the information used in the multivariate modelling to capture the combination of education level, the orientation of the education and work-based learning as part of the highest level of education (either apprenticeship or traineeship). Work experience outside the curriculum is not included, because this is a type of work experience that cannot be impacted by education policies. Graduates with work experiences outside their studies at the highest level of education form a contrast group alongside those with no work experiences during their studies.

Six variables have been constructed for the analysis:

- (a) ISCED 2 or below (low-level education: at most, lower secondary education);
- (b) GEN34 (ISCED 3-4, general medium-level education);
- (c) WBV34 (ISCED 3-4, vocational medium-level education, with experience of work-based learning);
- (d) SBV34 (ISCED 3-4, vocational medium-level education, with no experience of work-based learning);
- (e) WBT58 (ISCED 5-8, tertiary education, with experience of work-based learning);
- (f) SBT58 (ISCED 5-8, tertiary education, with no experience of work-based learning).

Table 1. **Operationalisation of independent variable measuring education level, orientation and work-based learning in the multivariate regression models**

Education level	Orientation	Nature	ISCED 2 or below	GEN34 _{ij}	WBV34 _{ij}	SBV34 _{ij}	WBT58 _{ij}	SBT58 _{ij}
ISCED 2 or below	-	-	1	0	0	0	0	0
ISCED 3-4	GEN	-	0	1	0	0	0	0
	VOC	WBL: YES	0	0	1	0	0	0
		WBL: NO	0	0	0	1	0	0
ISCED 5-8	N/A	WBL: YES	0	0	0	0	1	0
		WBL: NO	0	0	0	0	0	1

Source: Eurostat EU-LFS AHM 2016 microdata, own operationalisation.

Each stepped model of the multilevel logistic regression analysis and each model of the country-specific logistic regression analysis has been performed twice: once with WBV34 as the reference category and once with WBT58 as the reference category, specifically to investigate how work-based learning in these two levels of education relates to the labour market outcomes.

The sociodemographic control variables in the models are:

- (a) age;
- (b) sex;
- (c) country of birth;
- (d) marital status ⁽⁵⁾.

2.6. Data and limitations

2.6.1. General characteristics of the data

The EU-LFS is a large-sample survey of private households, which provides detailed quarterly and annual data on a number of key labour market aspects, including employment and its quality. Information on educational background of individuals is also collected, including the level and the orientation (general or vocational) of the highest qualification attained. The sample size is about 1.8 million persons per quarter, and surveys are carried out every quarter. The survey is the reference source of information for educational attainment and labour market outcomes of education at EU level.

⁽⁵⁾ Household working status as an additional independent variable was excluded to multicollinearity issues.

The ad hoc modules of the EU-LFS are separate from the core standard survey; they provide additional information on selected topics, varying from year to year. The 2016 topic ‘young people on the labour market’ was not new. Although with different titles and methodological approaches, two previous EU-LFS ad hoc modules generated additional insights on young people:

- (a) the 2000 module on ‘transition from school to working life’;
- (b) the 2009 one on ‘entry of young people into the labour market’.

Difficulties in collecting high-quality data on durations, first significant work experiences and individual trajectories led to changes in definitions, variables and titles of the modules. They also motivated the choice to look only at the current employment status of young graduates in this report.

The 2016 ad hoc module was administered to respondents in the 15 to 34 age group. In the LFS AHM 2016 module, Spain and the United Kingdom only provide data for those aged 16 to 34.

The content and the technical characteristics, including variables, filters and codes to be used in the 2016 ad hoc module were established by Commission implementing regulation (European Commission, 2015b). Eurostat (European Commission and Eurostat, 2016) provided detailed specifications for the implementation of the module in the form of explanatory notes. Specifications concerned rationale, purpose, definition and description of the variables and guidance on how to measure them, including a standard recommended questionnaire. Some of the variables allowed capture of information on whether the educational background of individuals contained experiences of work-based learning.

After a first submission, and following quality checks, a few countries revised the data initially submitted to Eurostat. This report makes use of the revised microdata available at Eurostat.

2.6.2. Data issues and limitations

Data originate from a sample survey and are subject to the related methodology and implementation issues. Data quality is documented and assessed by Eurostat, also on the basis of information from individual countries (Eurostat, 2018a). Of particular relevance for this analysis is the quality of the data concerning the two variables of the 2016 ad hoc module (WORXEXP and WORKSTUD) which were used to capture work-based learning and its subcategories.

WORXEXP and WORKSTUD were used to identify the following information on individuals in the sample:

- (a) if they had work experience during their studies at the highest level of education or not;

- (b) if such experiences were part of the curriculum or not and, if so, whether they were a mandatory part of it;
- (c) if such experiences were paid or not;
- (d) if such experiences were of less than six months or had a longer duration.

The EU-LFS allows for proxy interviews and most of countries use them. This means that, if it is not possible to carry out the interview with the randomly selected respondent, another member of the household is asked to provide information on that targeted individual. Although a typical issue for the EU-LFS, this has a particular impact in the case of variables, such as WORKEXP and WORKSTUD; these refer to past experiences of the target individual, which the proxy respondent may not recall, along with other type of information. The extent and the impact of proxy answers is not documented specifically for the 2016 AHM. Information is available of the 2016 LFS in general. In Spain, Croatia, Malta, Portugal and Slovakia, proxy accounts for 70% or more of the interviews. Recall issues were documented for Cyprus and Hungary.

Country-level information on unit non-responses is not available. Based on a microdata analysis, some units (individuals) were found with missing values on all AHM variables. In relative terms, these were highest in Spain (5.5%), Ireland (14.6%) and Poland (14.3%), but still below a 15% threshold. Item non-response rates on the two pivotal variables for capturing and qualifying work-based learning were acceptable (lower than 15%) in almost all countries, except for the WORKEXP variable in Czechia (25.8%) and Germany (16.4%). As Eurostat advises caution in analysing and interpreting results when the threshold is overcome, results in this report are flagged for these two countries.

A number of issues were reported by countries concerning filtering, routing and flow of the questions, including those used for WORKEXP and WORKSTUD, which affected smooth implementation of the module. The complexity of the two variables, as well as their typical positioning in the flow (they were generally asked separately and away from the core questions on educational attainment), played a role. Respondent understanding of the work experience during or as part of the highest level of education, was different from that resulting from the standard LFS question on the existence of a previous work experience, leading to lack of coherence (Eurostat, 2018a). Prevalence patterns, particularly among VET graduates, varied from grounded expectations based on prior knowledge of system settings or on data from the UOE data collection (Annex 3). The additional questions to qualify such work experience in detail appeared complicated and did not always work well.

When countries were able to single out mandatory work-based learning as part of the curriculum at the highest level of education, they were also generally

able to distinguish between apprenticeships and mandatory traineeship. A specific answer category was devised for the variable WORKSTUD to accommodate cases where such distinction might be difficult. Fortunately, these cases were few. In most countries, with the exception of the Netherlands and Norway, the number of individuals reporting mandatory work-based learning where the distinction between mandatory traineeship and apprenticeship could not be made was small. This number was too small for analysis and publication, particularly in combination with ISCED levels. Therefore, for ease of clarity and simplicity, and without too much loss of information, this category was dropped in the analysis and related answers were filtered out. However, the methodological choice of dropping this category somehow affected the data for the Netherlands and Norway (Annex 17).

Deviations from the standard questions envisaged for the variables WORKEXP and WORKSTUD were adopted in Czechia, Denmark, Ireland, France, Malta, the Netherlands, Poland, Slovakia and Finland. This was to ensure better consideration of the country context and/or to smooth the flow, with a view to providing the required information better, but potentially leading to minor loss of comparability.

From a general perspective, a note of caution is to be used when interpreting the results of this study. Overall, the 2016 ad hoc module of the EU-LFS should be seen as an experimental attempt to capture work-based learning in the survey and the results should be interpreted as such.

In addition to data issues described above, a number of limitations affect the data and the analysis. The methodology adopted for the 2016 ad hoc module of the EU labour force survey does not allow to single out individuals who experienced work-based learning during or as part of their entire initial education and training, but only during or as part of their highest level of formal education. Experience of work-based learning is not captured when this occurred at lower or uncompleted levels of education or even in non-formal or informal education and training.

As the 2016 ad hoc module is of a cross-section nature, it does not support longitudinal observations of the same individuals over time. As the 2016 ad hoc module was administered only to young people, it has not been possible to investigate prevalence and outcomes of work-based learning for older cohorts of the population. Indications of the effects of initial work-based learning on the situation of older workers cannot be derived.

While the EU-LFS is a reference statistical source for data on educational attainment of individuals and their situation on the labour market, the survey does not offer much background information on factors and variables which could influence both the educational choices and the labour market situation of

respondents in the sample, which should ideally be included in the analysis. In some countries a possible selection bias may affect graduates from initial vocational education, including those with work-based learning experiences.

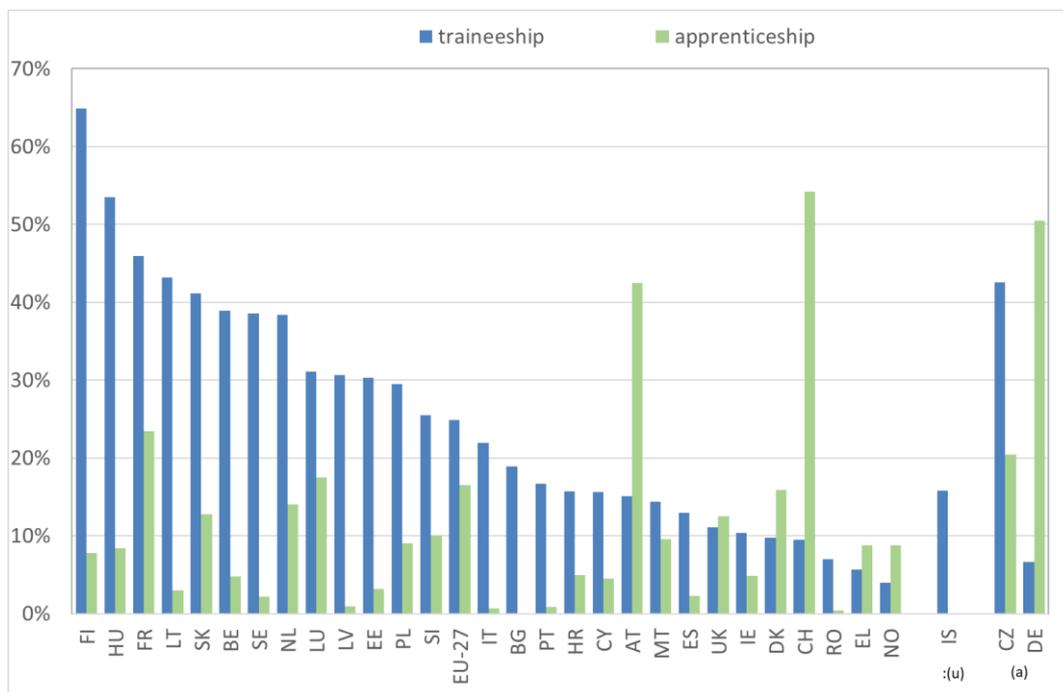
CHAPTER 3.

Prevalence of work-based learning during the highest-level educational attainment

3.1. Overall prevalence of work-based learning

Figure 4 shows the prevalence of work-based learning in the form of traineeships and apprenticeships as defined in this report and which occurred as part of the highest educational attainment, aggregated across all levels.

Figure 4. **Overall prevalence of traineeships and apprenticeships (EU-LFS AHM 2016 def.) experiences as part of the highest level of education attained, all education levels combined, among graduates aged 20-34 no longer in formal education)**



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

Labels: 'Traineeship': traineeships (EU-LFS AHM 2016 def.). 'Apprenticeship': apprenticeships (EU-LFS AHM 2016 def.).

Flags: No respondents available for apprenticeships: BG. Low reliability data on apprenticeships, flagged publication: LV, LT, PT.

Data: Table A.1 in Annex 2.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

Figure 4 can be seen as a consequence of the fact that, in European countries, national work-based learning policies are highly diverse and encompass

a broad variety of approaches. In some countries, work-based learning has a long tradition, often within vocational education and training, with dual apprenticeships and education-industry partnerships having operated successfully for many years. In these countries (Austria, Germany and Switzerland), apprenticeships account for the majority of WBL. However, the incidence of overall WBL is higher in Finland and France where it has gained momentum in more recent years.

In Annex 3 has a comparison of the share of graduates from work-based programmes during upper secondary vocational education in the LFS 2016 AHM to the incidence of work-based learning among upper secondary students based on Eurostat data/UOE data collection. The comparison is only indicative. It is carried out as possible validation of the LFS AHM data by criterion. This comparison shows that the magnitude of work-based learning, as measured in the LFS AHM 2016 module, strongly deviates from that resulting from the UOE data in most countries.

3.2. Prevalence of work-based learning by highest level of education attained

Section 3.2 analyses the prevalence, among young graduates, of work-based learning experiences as part of the highest educational attainment in the forms of traineeships and apprenticeships. The analysis is carried out by level (and orientation) of education. To contextualise and compare the results, data are also offered on graduates that have had no work experience during their highest level of education attained or had some work experience during (but not as part of) the highest level of education attained. The data underlying the figures in Chapter 3 can be found in Table A.3 in Annex 4.

In Figure 5, prevalence patterns of work-based learning are displayed for graduates with low levels of education (ISCED level 2 or below). For the EU-27, it was estimated that 83% of graduates with low levels of education had no work experience during their studies. Some 7% have worked outside the curriculum and 10% had a work-based learning experience as part of their education (being a trainee or an apprentice). Figure 5 illustrates cross-country differences. Countries are ranked according to the share of graduates having experienced traineeships or apprenticeships. In Finland, all graduates with a low level of education have participated in work-based learning (traineeships or apprenticeships). The share of trainees/apprentices is also high in France (49%), the Netherlands (37%), Sweden (28%) and Luxembourg (25%). In 10 countries, the share of graduates in traineeships or apprenticeships is too low to be published. Due to high item non-

response, the data for Germany need to be treated with caution. No data were available for Czechia.

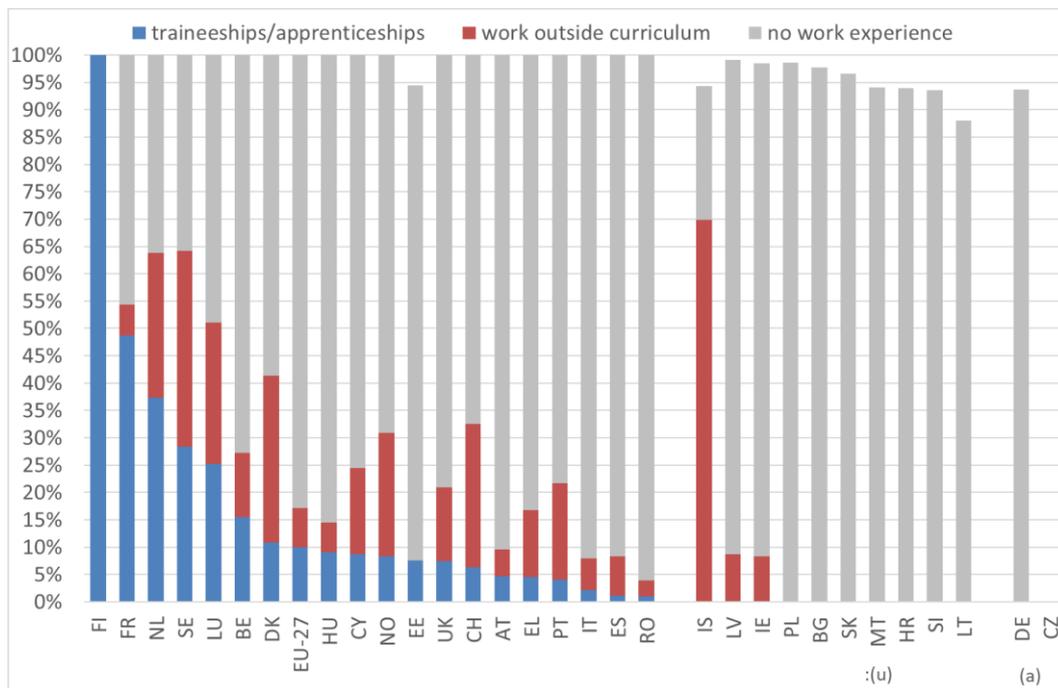
In Figure 6, prevalence patterns of work-based learning are displayed for graduates with, at most, medium-level qualifications of general orientation (ISCED level 3-4 GEN). For the EU-27, it was estimated that more than two thirds (68%) of graduates from general tracks in medium-level education have had no work experience during it. Slightly more than one fifth (22%) worked outside the curriculum and one out of 10 (10%) has been a trainee or an apprentice. In Luxembourg, 52% of graduates from medium-level general education have participated in a traineeship or an apprenticeship. The share of trainees/apprentices is also high in France (35%), Switzerland (27%) and the Netherlands (23%). In 10 countries, the share of graduates in traineeships or apprenticeships is too low to be published. Due to high item non-response, the data for Germany and Czechia need to be treated with caution.

In Figure 7, prevalence patterns of work-based learning are displayed for graduates with, at most, medium-level qualifications of vocational orientation (ISCED 3-4 VOC). Compared to the educational backgrounds mentioned before, larger shares of graduates have participated in traineeships or apprenticeships. For the EU-27, it was estimated that 31% of graduates from medium-level vocational education have not had any work experience during their studies, 9% have worked outside the curriculum, while 30% have been a trainee and 31% have been an apprentice. In 18 countries, more than half of graduates from medium-level vocational education (ISCED 3-4 VOC) have participated in either traineeships or apprenticeships. Only in three countries (Bulgaria, Greece and Romania) does the joint share of trainees/apprentices drop below 25%. In most countries, the prevalence of traineeships exceeds that of apprenticeships. In 10 countries, apprenticeships are more popular than traineeships. This is particularly the case in Austria, Denmark, Germany, Norway and Switzerland. In four countries, the share of graduates in apprenticeships is too low to be published. Due to high item non-response, the data for Germany and Czechia need to be treated with caution. No data are available for Luxembourg.

In tertiary education (Figure 8), the joint prevalence of traineeships/apprenticeships is lower than that among graduates from medium-level vocational education. For the EU-27, it was estimated that 32% of graduates from tertiary education (ISCED 5-8) have not had any work experience during it, 23% have worked outside the curriculum, while 32% have been a trainee and 12% have been an apprentice. In nine countries, more than half of tertiary-level graduates have participated in either traineeships or apprenticeships. In seven countries (Croatia, Cyprus, Denmark, Ireland, Norway, Romania and United

Kingdom) the joint share of trainees/apprentices drops below 25%. In most countries, the prevalence of traineeships exceeds that of apprenticeships, except for Greece and Switzerland. In five countries, the share of graduates in traineeships or apprenticeships is too low to be published. Due to high item non-response, the data for Germany and Czechia need to be treated with caution.

Figure 5. **Prevalence of work experiences by type, including work-based learning (traineeship/apprenticeship, EU-LFS AHM 2016 def.), at the highest level of education attained, graduates aged 20-34 no longer in formal education with at most lower secondary qualification (ISCED 2 or below)**



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

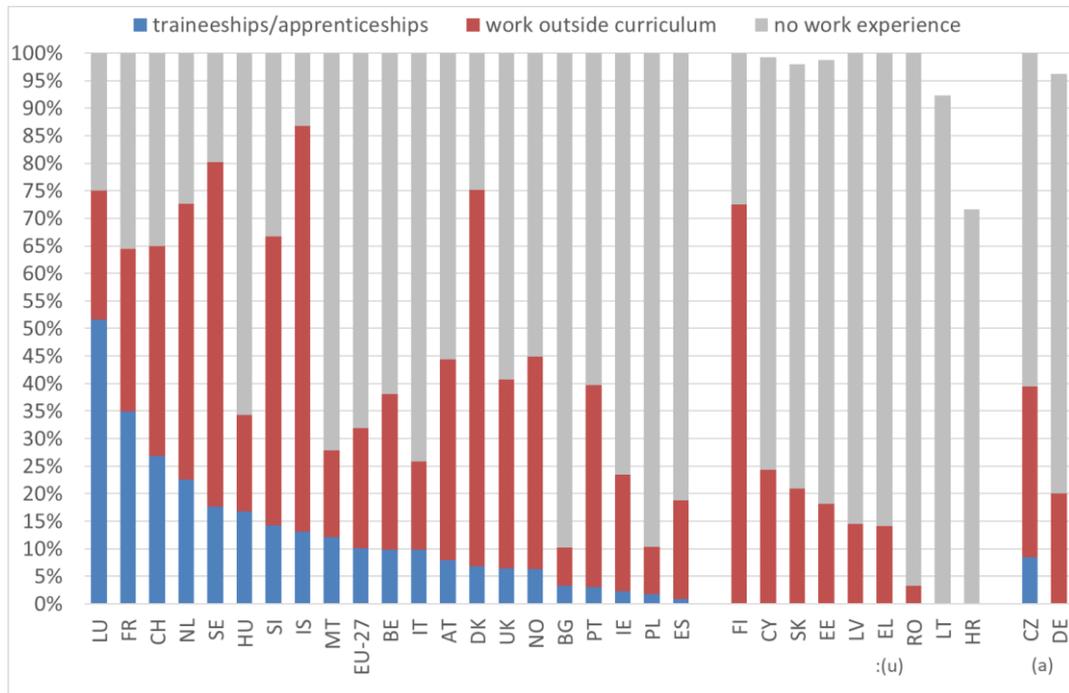
Labels: 'Traineeships/apprenticeships': traineeships/apprenticeships (EU-LFS AHM 2016 def.). 'Work outside curric.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: No respondents available for no work experience: FI, CZ. No respondents available for work outside curriculum: FI, CZ. No respondents available for traineeships and apprenticeships: CZ. Confidential data for traineeships and apprenticeships: LV, HR. Confidential data for work outside curriculum: SK, LT. Low reliability data on traineeships and apprenticeships, too low to be published: IS, IE, PL, BG, SK, MT, SI, LT, DE. Low reliability data on work outside curriculum, too low to be published: PL, BG, HR, MT, SI, DE. Low reliability data on traineeships and apprenticeships, flagged publication: LU, EE, AT, RO. Low reliability data on work outside curriculum, flagged publication: FR, LU, AT, LV, IE.

Data: Table A.3 in Annex 4.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

Figure 6. **Prevalence of work experiences by type, including work-based learning (traineeship/apprenticeship, EU-LFS AHM 2016 def.) at the highest level of education attained, graduates aged 20-34 no longer in formal education with at most a medium-level qualification of general orientation (ISCED 34, 44)**



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

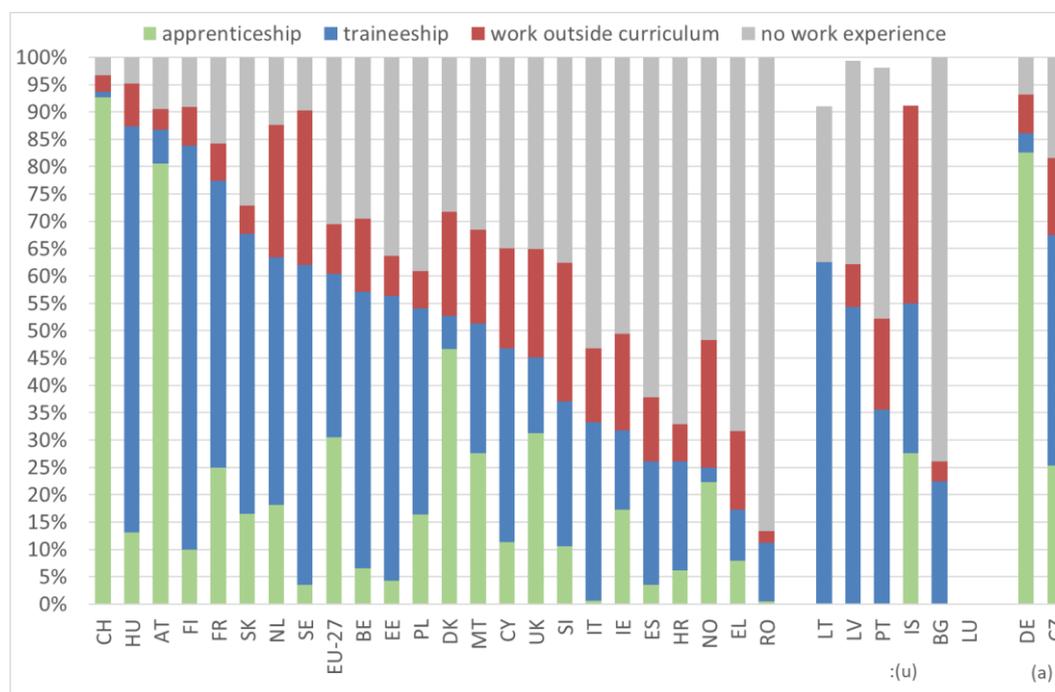
Labels: 'Traineeships/apprenticeships': traineeships/apprenticeships (EU-LFS AHM 2016 def). 'Work outside curric.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: No respondents available for no work experience: FI. No respondents available for traineeships and apprenticeships: FI, LV, EL, RO, HR. Low reliability data on traineeships and apprenticeships, too low to be published: CY, SK, EE, LT, DE. Low reliability data on work outside curriculum, too low to be published: LT, HR. Low reliability data on traineeships and apprenticeships, flagged publication: SI, MT, AT, DK, BG, IE, PL, ES, CZ. Low reliability data on work outside curriculum, flagged publication: SI, MT, RO. Low reliability data on no work experience, flagged publication: SI, HR.

Data: Table A.3 in Annex 4.

Source: Eurostat, EU-LFS AHM 2016 microdata; own calculations.

Figure 7. **Prevalence of work experiences by type, including work-based learning (traineeship/apprenticeship, EU-LFS AHM 2016 def.) at the highest level of education attained, graduates aged 20-34 no longer in formal education with at most a medium-level qualification of vocational orientation (ISCED 35, 45)**



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

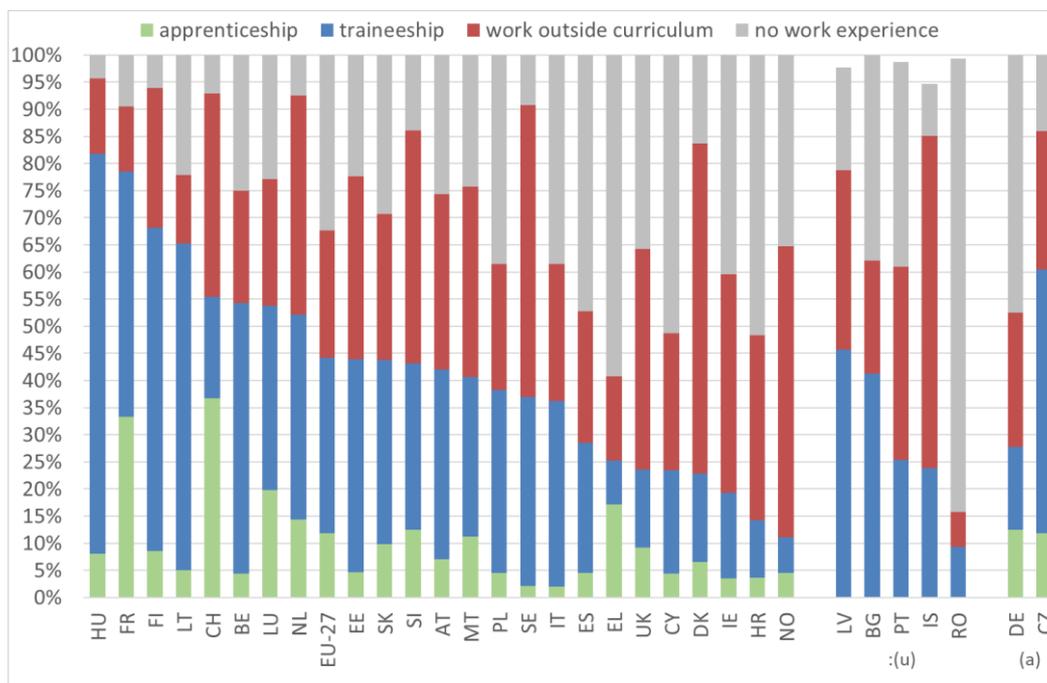
Labels: 'Traineeship': traineeships (EU-LFS AHM 2016 def.). 'Apprenticeship': apprenticeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: No respondents available for apprenticeship: BG. Low reliability data on apprenticeships, too low to be published: LU, LT, LV, PT. Low reliability data on work outside curriculum, too low to be published: LU, LT. Low reliability data on no work experience, too low to be published: IS, LU. Low reliability data on apprenticeships, flagged publication: EE, HR, RO. Low reliability data on traineeships, flagged publication: DK, MT, NO. Low reliability data on work outside curriculum, flagged publication: EE, MT, HR, LV.

Data: Table A.3 in Annex 4.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

Figure 8. **Prevalence of work experiences by type, including work-based learning (traineeship/apprenticeship, EU-LFS AHM 2016 def.) at the highest level of education attained, graduates aged 20-34 no longer in formal education with a tertiary-level qualification (ISCED 5-8)**



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

Labels: 'Traineeship': traineeships (EU-LFS AHM 2016 def.). 'Apprenticeship': apprenticeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: No respondents available for apprenticeship: BG. Low reliability data on apprenticeships, too low to be published: LV, PT, IS, RO. Low reliability data on apprenticeships, flagged publication: EE, SI, MT, HR. Low reliability data on traineeships, flagged publication: HR.

Data: Table A.3 in Annex 4.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

3.3. Profile of graduates

Section 3.3. deals with the sociodemographic profiling of graduates having obtained a qualification from medium-level vocational education (ISCED level 3-4 VOC) or from tertiary education (ISCED level 5-8) as their highest. Particular attention is devoted to the profile of graduates with a work-based learning experience in the form of traineeship and apprenticeship. Comparisons are also provided with graduates who did not acquire any type of work experience during their studies at the same level of education (or at the same level and orientation, where applicable).

Section 3.3 focuses on gender, age and country of birth. Additional data on these variables can be found in the annexes (Annex 5 for gender, Annex 6 for age

and Annex 8 for country of birth). Data on marital status can be found in Annex 7, and on household working status (whether all adults in the household are working) can be found in Annex 9. Because of high item non-response (>15%), the discussion of the findings does not include comments on Czechia and Germany. Additional methodological information can be found in Section 2.5.

3.3.1. Gender

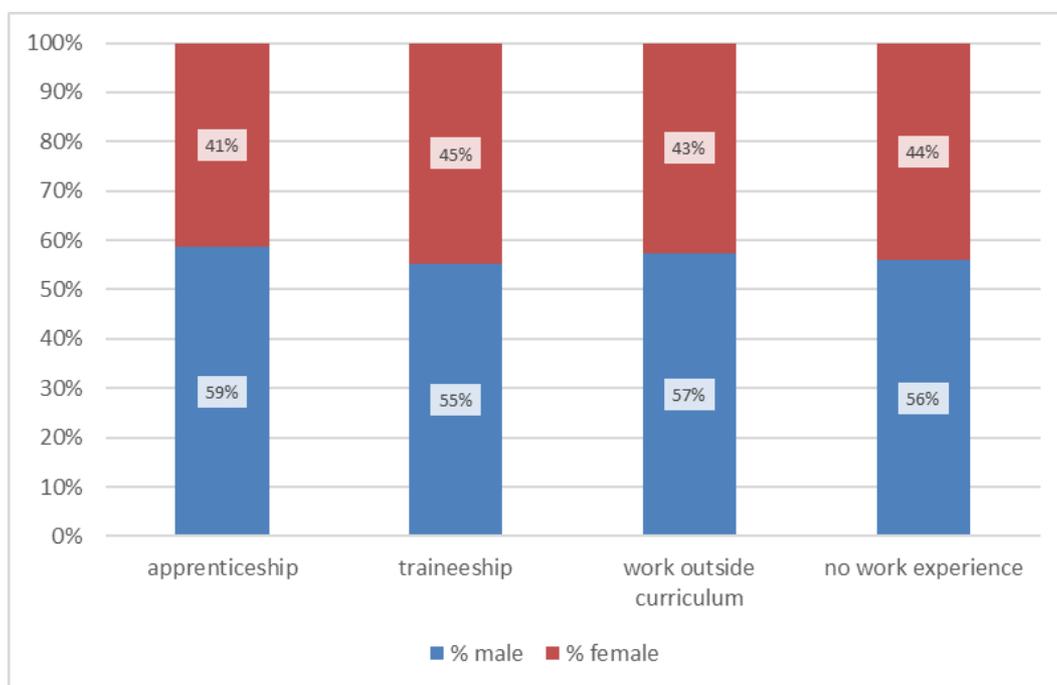
Figures 9 and 12 focus on the EU-level gender distribution of graduates from medium-level vocational education (Figure 9) and from tertiary education (Figure 12) considering different types of work experiences: apprenticeship, traineeship, work experiences during the highest education attained but not as part of it, and no work experience during the highest education attained. In Figures 10, 11, 13 and 14, country-specific data are displayed and countries are ranked according to the overrepresentation of male graduates with traineeships experiences (Figure 10 and 13) or apprenticeships experiences (Figures 11 and 14), relative to the graduates who did not acquire any type of work experience during the highest education (no participation in traineeships and apprenticeships, and no work experience outside the curriculum). This subgroup represents the reference for comparisons; the label used in the charts is 'no work experience'. A cut-off of 10% is used to qualify over- or underrepresentation:

- (a) overrepresentation of males in traineeships/apprenticeships: if the share of male graduates in traineeships/apprenticeships exceeds the share of male graduates who did not acquire any work experience during their highest education by 10% or more;
- (b) underrepresentation of males in traineeships/apprenticeships: if the share of male graduates in traineeships/apprenticeships is below the share of male graduates who did not acquire any work experience during their highest education by 10% or more.

3.3.1.1. *Graduates from medium-level vocational education*

Figure 9 shows the EU-level gender distribution among graduates from medium-level vocational education by work experience at the highest education attained. Overall, it is observed that the share of male graduates from medium-level vocational education (ISCED 3-4 VOC) is above 50%, with small differences based on the types of work experience. For work-based learning as part of medium-level vocational education, it was estimated that, in the EU-27, males account for 55% of graduates with a traineeship experience and for 59% of graduates with an apprenticeship experience.

Figure 9. **Gender distribution of graduates with at most a medium-level vocational qualification (ISCED 35, 45) by type of work experience at their highest education attained, including traineeships and apprenticeships (EU-LFS AHM 2016 def.), EU-27 (graduates aged 20-34, not in formal education), 2016**



NB: 'Traineeship': traineeships (EU-LFS AHM 2016 def.).

'Apprenticeship': apprenticeships (EU-LFS AHM 2016 def.).

'Work outside curriculum': work outside curriculum.

'No work experience': no work experience during highest level of education.

Data: Table A.4 in Annex 5.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

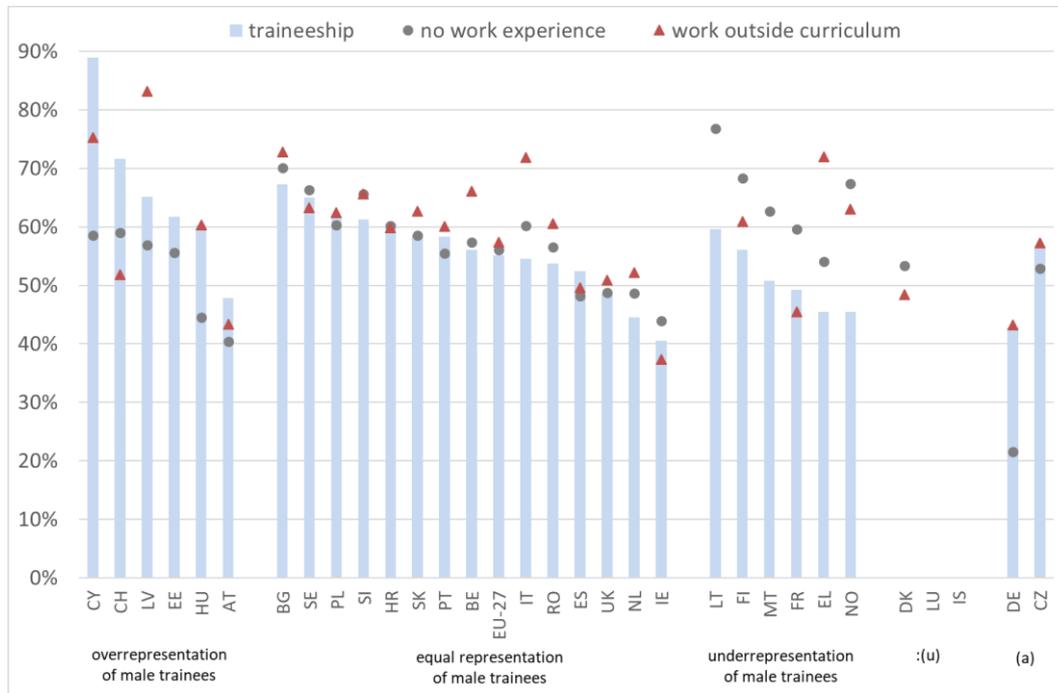
In Figures 10 and 11, gender-related data are presented at country level for medium-level vocational graduates with a traineeship (Figure 10) and apprenticeship (Figure 11) experience. The figures also offer an analysis of over- or underrepresentation of males graduates with these two forms of work-based learning experiences compared to graduates with no work experience during their highest education attained medium-level vocational education).

Figure 10 shows that, among graduates from medium-level vocational education with a traineeship experience, the share of males exceeds 50% in almost all countries, except for Austria, France, Greece, Ireland, the Netherlands, Norway and the United Kingdom. When comparing the share of male graduates with a traineeship experience to the share of male graduates with no work experience during their highest education attained (medium-level vocational education), in 14 countries, as well as for the EU-27 average, the gender distribution is similar in these two subgroups. In six countries (Austria, Cyprus,

Estonia, Hungary, Latvia and Switzerland), male graduates are overrepresented in the subgroup of graduates with traineeship experience when compared to the subgroup of graduates who did not acquire any work experience during their highest education attained. In six countries (France, Finland, Greece, Lithuania, Malta and Norway), men are underrepresented among traineeship graduates when compared to graduates who did not acquire any work experience during their highest education.

Figure 11 shows that the share of males among graduates with an apprenticeship experience is higher than 50% in most countries, except for the Netherlands. Comparing the share of male graduates with an apprenticeship WBL experience to the share of male graduates without any work experience during their education attained (medium-level vocational education), in eight countries, as well as in the EU-27 as a whole, the gender distribution is similar. In 12 countries (Belgium, Denmark, Ireland, Spain, France, Italy, Cyprus, Hungary, Malta, Austria, Sweden and the United Kingdom) male graduates are overrepresented in apprenticeships, when compared to graduates who did not acquire any work experience in medium-level vocational education. Only in Switzerland are women overrepresented.

Figure 10. **Share of males among graduates with at most a medium-level vocational qualification (ISCED 35, 45) by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016**



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

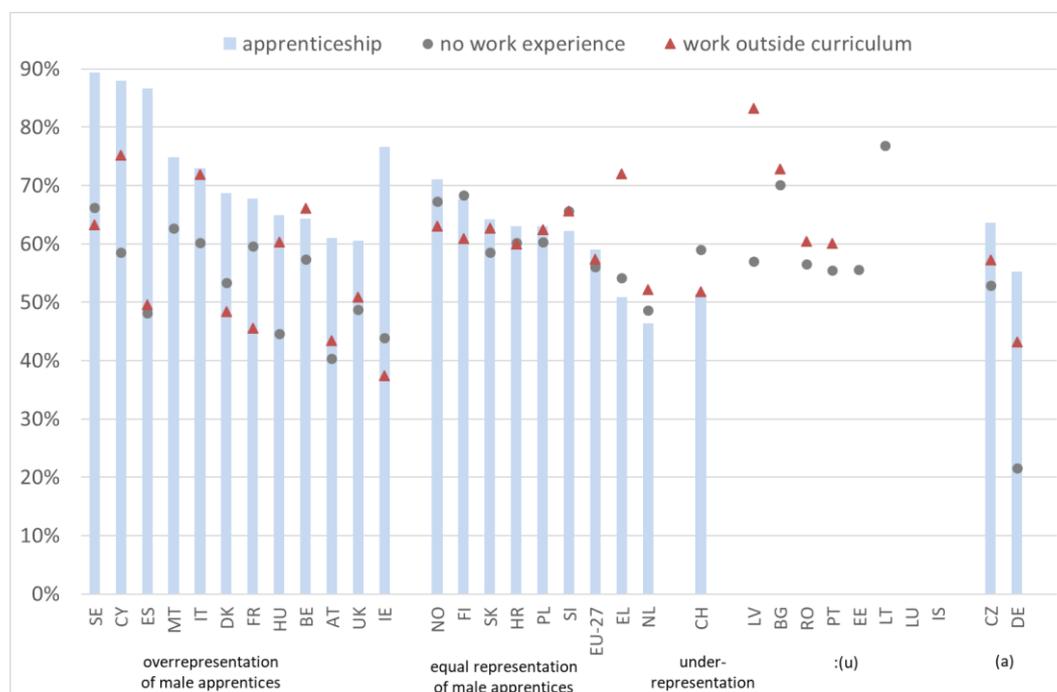
Labels: 'Traineeship': traineeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: Low reliability data on work outside the curriculum, too low to be published: EE, LT, MT, LU. Low reliability data on no work experience, too low to be published: LU. Low reliability data on traineeships, too low to be published: LU. Low reliability data on work outside the curriculum, flagged publication: LV, BG, HR. Low reliability data on traineeships, flagged publication: CH, MT, NO.

Data: Table A.4 in Annex 5.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

Figure 11. **Share of males among graduates with at most a medium-level vocational qualification (ISCED 35, 45) by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016**



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

Labels: 'Apprenticeship': apprenticeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: No respondents available for apprenticeships: BG. Confidential data for apprenticeships: LV. Low reliability data on work outside the curriculum, too low to be published: MT, EE, LT, LU. Low reliability data on apprenticeships, too low to be published: RO, PT, EE, LT, LU. Low reliability data on no work experience, too low to be published: LU. Low reliability data on no work experience, flagged publication: MT. Low reliability data on work outside the curriculum, flagged publication: HR, LV, BG. Low reliability data on apprenticeships, flagged publication: MT, HR, SI.

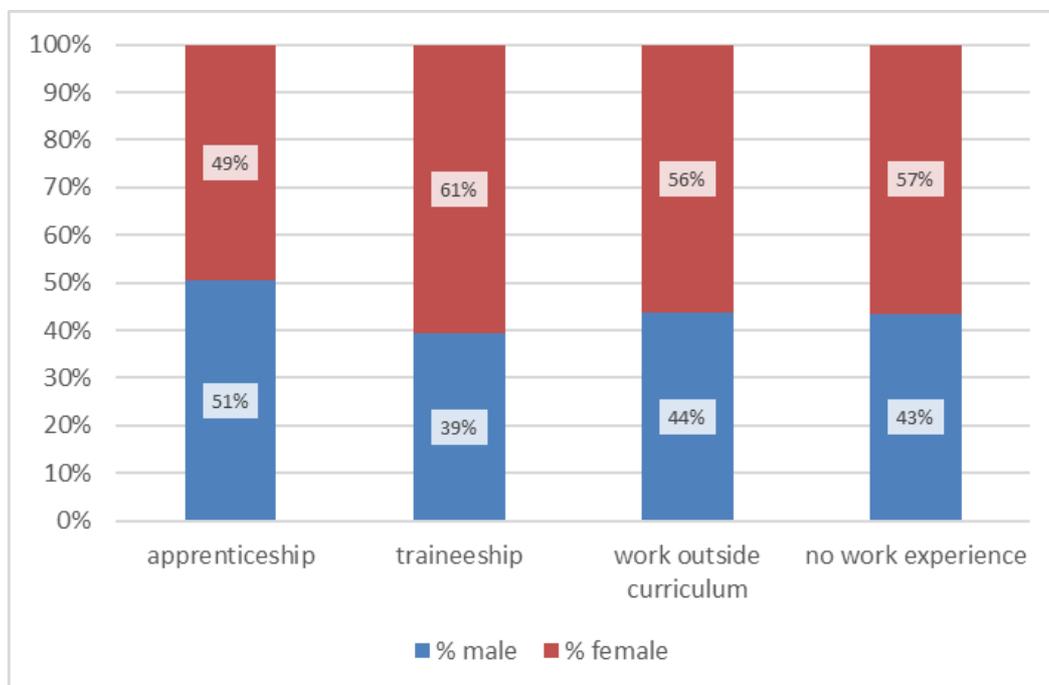
Data: Table A.4 in Annex 5.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

3.3.1.2. Graduates from tertiary education

Figure 12 shows the EU-level gender distribution for graduates from tertiary education by work experience at their highest level of education attained. For graduates with an apprenticeship experience, the distribution by gender is fairly balanced (51% male, 49% female). Female graduates account for the majority of graduates with a traineeship experience (61% females and 39% males), as well as for the majority of graduates with work outside the curriculum (56% females and 44% males). They also account for the majority of graduates with no work experience during tertiary education (57% of females and 43% males).

Figure 12. **Gender distribution of graduates with a tertiary-level qualification (ISCED 5-8) by type of work experience at their highest education attained, including traineeships and apprenticeships (EU-LFS AHM 2016 def.), EU-27, (graduates aged 20-34, not in formal education), 2016**



NB: 'Traineeship': traineeships (EU-LFS AHM 2016 def.).

'Apprenticeship': apprenticeships (EU-LFS AHM 2016 def.).

'Work outside curriculum': work outside curriculum.

'No work experience': no work experience during highest level of education

Data: Table A.4 in Annex 5.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

In Figures 13 and 14, the gender profile for graduates with a traineeship and apprenticeship experience in tertiary education is displayed at country level and compared to that of graduates with no work experience during their tertiary education.

Figure 13 shows the share of males for graduates from tertiary education with traineeship experience is lower than 50% in all countries and in the EU-27 on average. In 15 countries, and in the EU-27 as a whole, men are underrepresented among tertiary-level graduates with a traineeship experience, when compared to other tertiary-level graduates who did not acquire any work experience. In 13 countries, the gender distribution is similar across the two subgroups of graduates.

The findings for tertiary education level apprentices in Figure 14 show a different picture. On average, and in most countries, the share of male graduates for tertiary education graduates with an apprenticeship exceeds 50%. In tertiary-level education, in nine countries (Greece, France, Lithuania, Luxembourg, Cyprus, Hungary, Poland, Slovakia and Finland) as well as for the EU-27 as a

whole, male graduates with an apprenticeship are overrepresented when compared to other tertiary-level graduates who did not acquire any type of work experience. In 11 countries, the gender distribution is similar across these two subgroups. Only in the Netherlands are women overrepresented in the subgroup of tertiary-level graduates with apprenticeship, when compared to other graduates who did not acquire any work experience during the same level of education.

3.3.1.3. *Summary of findings at the EU-27 level*

Among graduates from medium-level vocational education, the share of males was estimated at 55% for those who had a traineeship experience and at 59% for those who had apprenticeship. The gender distribution for graduates with traineeship or apprenticeship experiences does not differ considerably from the gender distribution of graduates who did not acquire any work experience during their medium-level vocational education.

For graduates from tertiary education, almost half (51%) of those with an apprenticeship experience were estimated to be males in the EU as a whole. This share of males was lower for tertiary graduates with a traineeship experience, at 39%. Compared to graduates with no work experience during tertiary education, male graduates are overrepresented in the subgroup of those with apprenticeships, while male graduates are underrepresented in the subgroup of those with a traineeship experience.

Figure 13. Share of males among graduates with a tertiary-level qualification (ISCED 5-8) by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

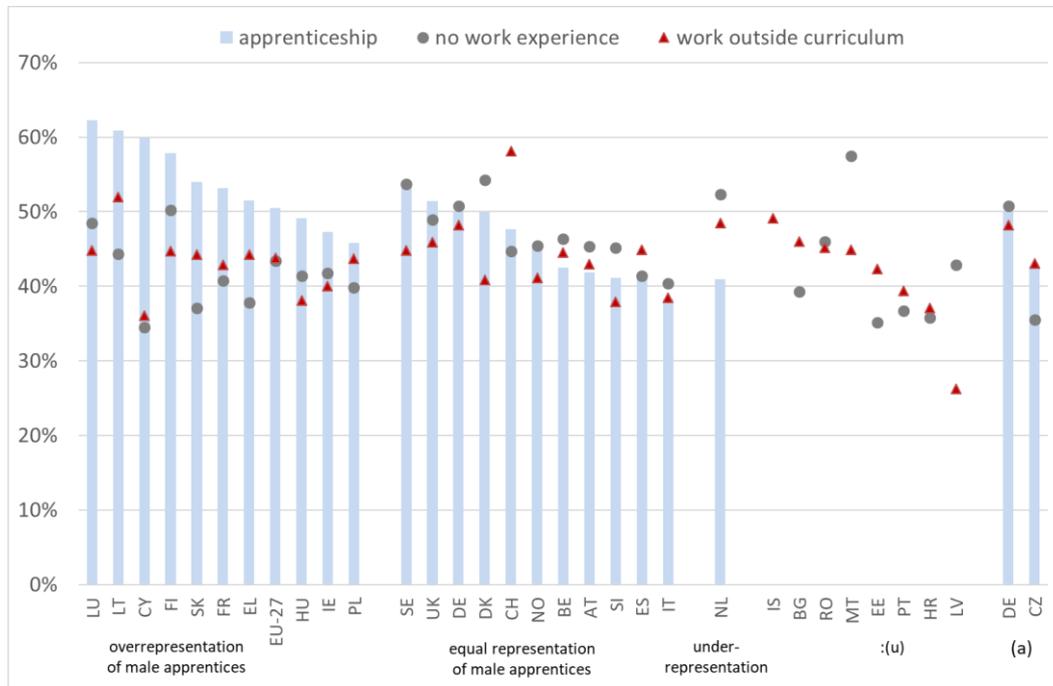
Labels: 'Traineeship': traineeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: Low reliability data on no work experience, too low to be published: IS. Low reliability data on no work experience, flagged publication: HU, SI, MT, LU, HR. Low reliability data on work outside the curriculum, flagged publication: MT, LU, HR. Low reliability data on traineeships, flagged publication: MT, LU, HR, IS.

Data: Table A.4 in Annex 5.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

Figure 14. **Share of males among graduates with tertiary-level qualification (ISCED 5-8) by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016**



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

Labels: 'Apprenticeship': apprenticeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: No respondents available for apprenticeships: BG. Confidential data for apprenticeships: HR. Low reliability data on no work experience, too low to be published: IS. Low reliability data on apprenticeships, too low to be published: IS, RO, MT, EE, PT, LV. Low reliability data on no work experience, flagged publication: LU, HU, SI, MT, HR. Low reliability data on work outside the curriculum, flagged publication: LU, MT, HR. Low reliability data on apprenticeships, flagged publication: LU, LT, SE, DK, SI, IT.

Data: Table A.4 in Annex 5

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

3.3.2. Age

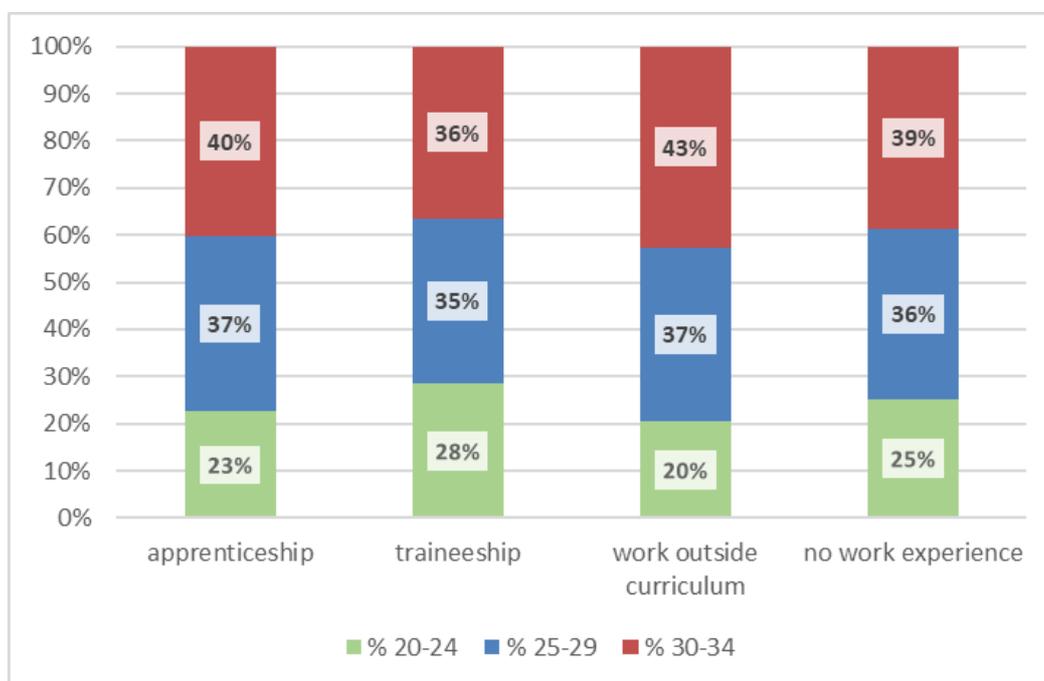
3.3.2.1. Graduates from medium-level vocational education

Figure 15 displays the age distribution for graduates with at most a medium-level vocational education of a work experience at their highest level of education attained. It shows that in the broad group of graduates from medium-level vocational education, for the EU-27 as a whole, the biggest proportion by age is those aged 30 to 34, followed by those aged 25 to 29 and then by those aged 20 to 24. This holds across various subcategories.

Figure 15 also shows that the proportion of 25- to 29-year-olds is similar across various subgroups of medium-level vocational graduates: graduates with a

traineeship experience, graduates with an apprenticeship experience, graduates who have worked outside the curriculum and graduates with no work experience during their highest education attained, ranging between 35% and 37%. Slightly bigger differences can be observed in the youngest and oldest age categories. The age distributions for graduates with apprenticeship experiences and for graduates with no work experience are also similar. Graduates with traineeship experiences are the youngest compared to other subcategories.

Figure 15. **Age groups distribution of graduates with at most a medium-level vocational qualification (ISCED 35, 45) by type of work experience during their highest education attained, including traineeships and apprenticeships (EU-LFS AHM 2016 def.), EU-27 (graduates aged 20-34, not in formal education), 2016**



NB: 'Traineeship': traineeships (EU-LFS AHM 2016 def.).

'Apprenticeship': apprenticeships (EU-LFS AHM 2016 def.).

'Work outside curriculum': work outside curriculum.

'No work experience': no work experience during highest level of education.

Data: Table A.5 in Annex 6.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

Figure 16 shows that among graduates from vocational medium-level education, in most countries (n=14) as well as for the EU-27 average, the share of 25- to 29-year-olds is similar in the subgroup of those with a traineeship experience and in the subgroup of those who did not acquire any work experience during their highest education attained (medium-level vocational education). In seven countries (Estonia, Ireland, Cyprus, Latvia, the Netherlands, Austria and Slovakia),

those aged 25 to 29 are overrepresented in the subgroup of those with a traineeship, when compared to graduates who did not acquire any work experience during their highest education. In Belgium and Portugal, this group is underrepresented in the subgroup of those with a traineeship, when compared to the subgroup of those who did not acquire any work experience during their medium-level vocational education.

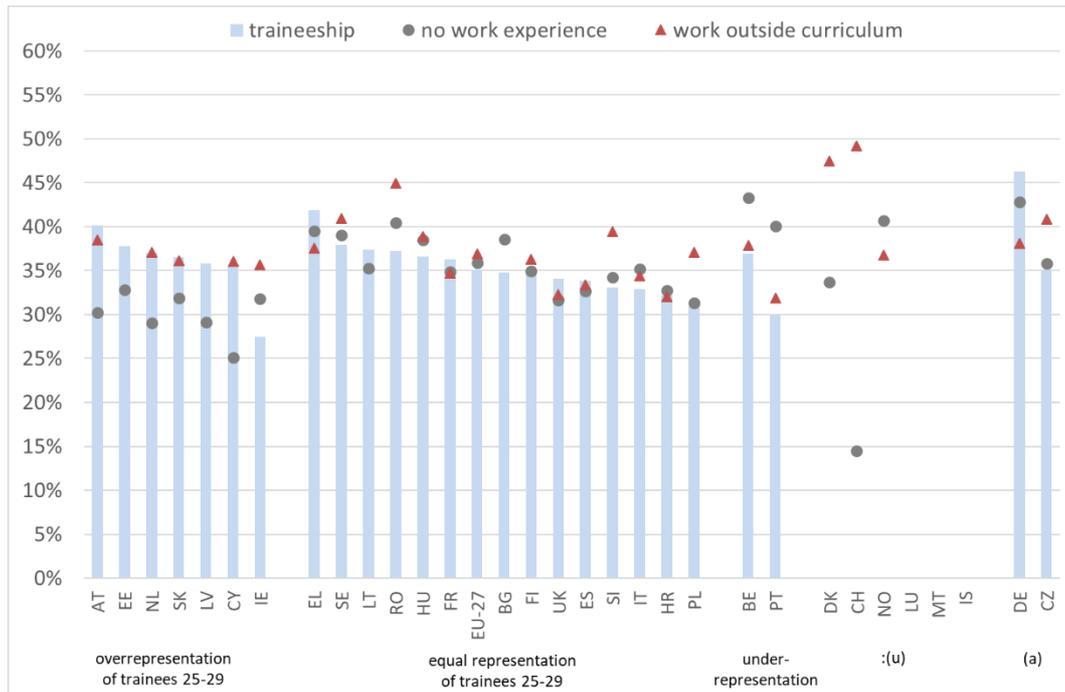
Figure 17 shows that among graduates from medium-level vocational education, in nine countries as well as for the EU-27 average, the share of the 30- to 34-year-olds is similar in the subgroup of those with a traineeship experience and in the subgroup of those who did not acquire any work experience during their highest education (medium-level vocational education). In five countries (Belgium, Bulgaria, Norway, Sweden and the United Kingdom), 30- to 34-year-olds are overrepresented in the subgroup of graduates with a traineeship experience compared to the subgroup of graduates who did not acquire any work experience. In 11 other countries, the 30- to 34-year-olds are underrepresented among graduates with a traineeship type of experience, when compared to graduates who did not acquire any work experience.

Figure 18 shows that among graduates from medium-level vocational education, in 11 countries as well as for the EU-27 as a whole, the share of 25- to 29-year-olds is similar in the subgroup of those with an apprenticeship experience and in the subgroup of those who did not acquire any work experience during their vocational education. In seven countries (Austria, Cyprus, Italy, the Netherlands, Spain, Switzerland and the United Kingdom), graduates aged 25 to 29 are overrepresented in the subgroup of those with an apprenticeship experience compared to the subgroup of those who did not acquire any work experience in vocational medium-level education. Only in Croatia and Norway are medium-level vocational education graduates aged 25 to 29 underrepresented in the subgroup of those with an apprenticeship, compared to the subgroup of those who did not acquire any work experience during their vocational education.

Figure 19 shows that, among graduates from medium-level vocational education, in nine countries as well as for the EU-27 as a whole, the share of graduates aged 30 to 34 is similar in the subgroup of those with apprenticeship experience and in the subgroup of those who did not acquire any work experience during their highest education (medium-level vocational education). This age group is overrepresented among graduates with an apprenticeship in Belgium, Croatia, Ireland, Spain and the United Kingdom as compared to graduates who did not acquire any work experience during their medium-level vocational education. In Cyprus, the Netherlands, Norway, Slovenia and Switzerland, graduates aged 30 to 34 are underrepresented in the subgroup of those with an apprenticeship

experience compared to graduates who did not acquire any work experience during their medium-level vocational education.

Figure 16. **Share of 25- to 29-year-olds, among graduates with at most a medium-level vocational qualification (ISCED 35, 45) by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016**



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

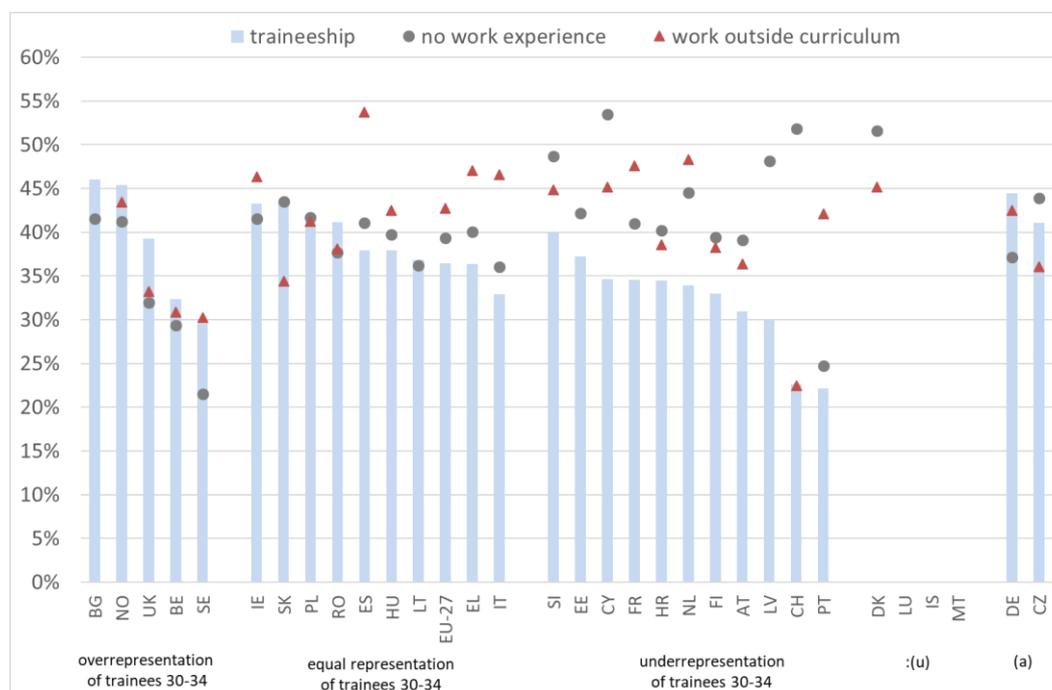
Labels: 'Traineeship': traineeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: No respondents available for no work experience: IS. Confidential data for traineeships: CH. Low reliability data on no work experience, too low to be published: MT, LU. Low reliability data on work outside the curriculum, too low to be published: EE, LV, MT, IS, LU. Low reliability data on traineeships, too low to be published: NO, DK, MT, IS, LU. Low reliability data on no work experience, flagged publication: CH. Low reliability data on work outside the curriculum, flagged publication: CY, RO, FR, HR. Low reliability data on traineeships, flagged publication: HR, IE.

Data: Table A.5 in Annex 6.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

Figure 17. Share of 30- to 34-year-olds, among graduates with at most a medium-level vocational qualification (ISCED 35, 45) by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

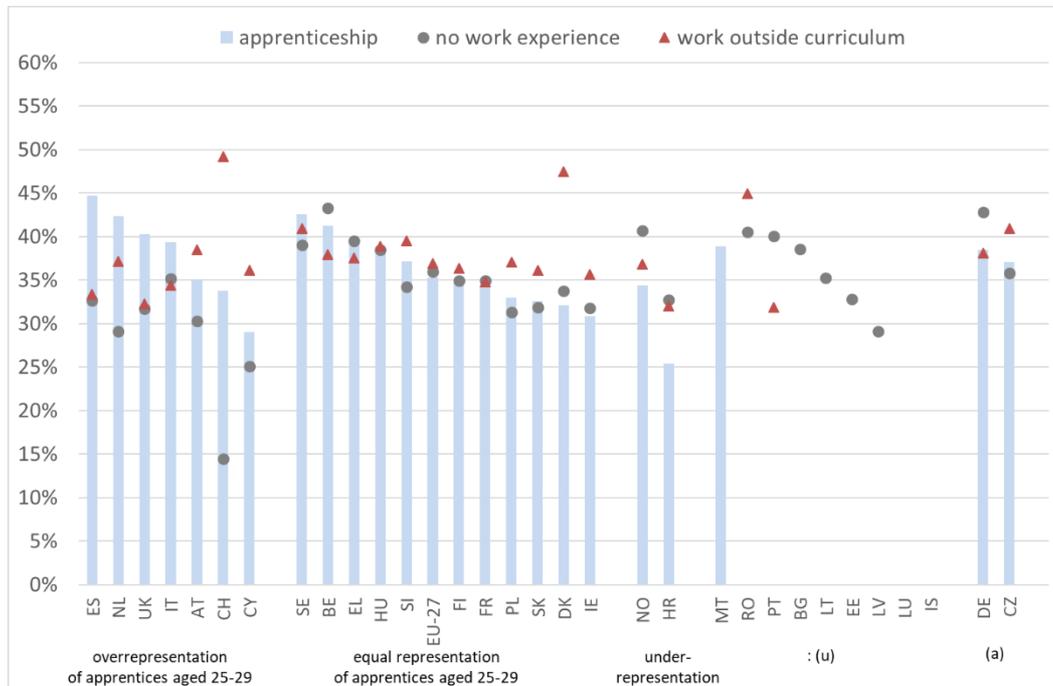
Labels: 'Traineeship': traineeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: Confidential data for no work experience: IS. Low reliability data on no work experience, too low to be published: MT, LU. Low reliability data on work outside the curriculum, too low to be published: BG, EE, LV, LT, MT, LU, IS. Low reliability data on traineeships, too low to be published: DK, IS, MT, LU. Low reliability data on work outside the curriculum, flagged publication: HR, AT, RO, CH. Low reliability data on traineeships, flagged publication: HR, NO, CH.

Data: Table A.5 in Annex 6.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

Figure 18. Share of 25- to 29-year-olds, among graduates with at most a medium-level vocational qualification (ISCED 35, 45) by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

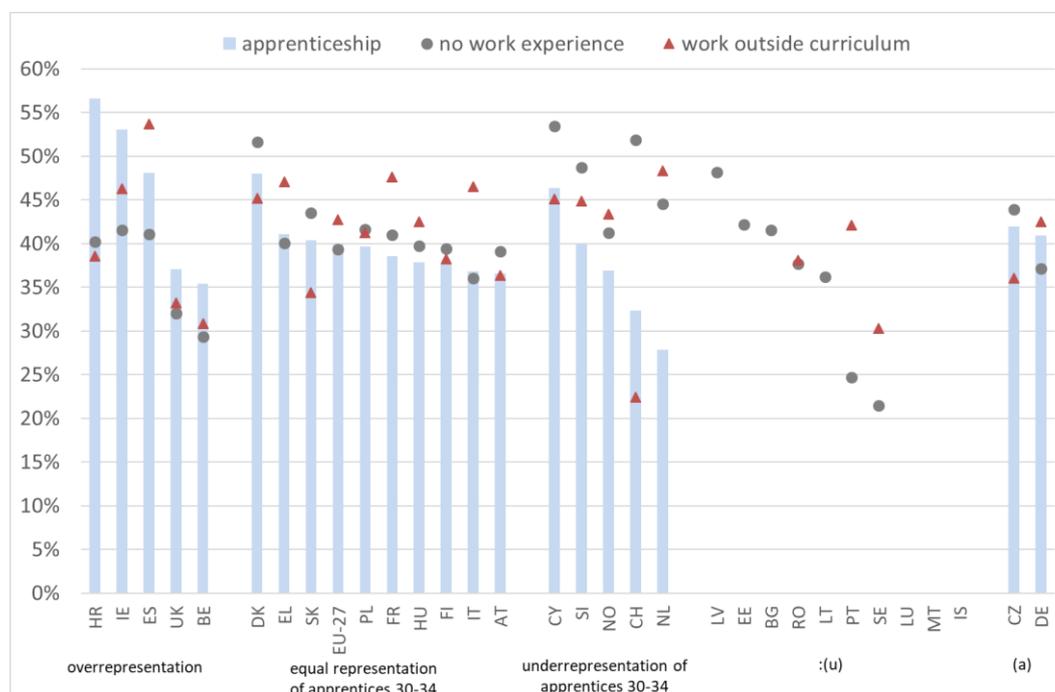
Labels: 'Apprenticeship': apprenticeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: No respondents available for no work experience: IS. Confidential data on traineeships: CH. Low reliability data on no work experience, too low to be published: MT, LU. Low reliability data on work outside the curriculum, too low to be published: EE, LV, MT, LU. Low reliability data on traineeships, too low to be published: DK, NO, LU, MT, IS. Low reliability data on no work experience, flagged publication: CH. Low reliability data on work outside the curriculum, flagged publication: CY, FR, HR, RO. Low reliability data on apprenticeships, flagged publication: ES, CY, SE, SI, HR, MT.

Data: Table A.5 in Annex 6.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

Figure 19. Share of 30- to 34-year-olds, among graduates with at most a medium-level vocational qualification (ISCED 35, 45) by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

Labels: 'Apprenticeship': apprenticeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: No respondents available for apprenticeships: BG, LV. Confidential data for no work experience: IS. Confidential data for apprenticeships: LT. Low reliability data on no work experience, too low to be published: MT, LU. Low reliability data on work outside the curriculum, too low to be published: BG, EE, IS, LV, LT, MT, LU. Low reliability data on apprenticeships, too low to be published: EE, IS, MT, PT, RO, SE, LU. Low reliability data on work outside the curriculum, flagged publication: HR, AT, RO, CH. Low reliability data on apprenticeships, flagged publication: ES, HR, CY, SI.

Data: Table A.5 in Annex 6

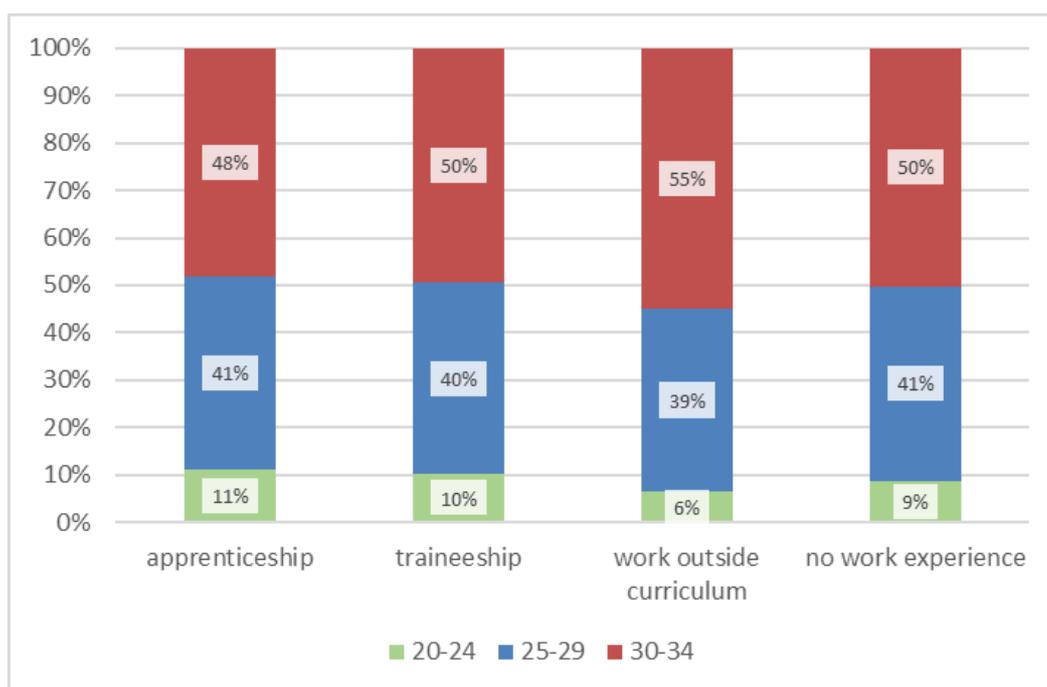
Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

3.3.2.2. Graduates from tertiary education

Figure 20 displays the age distribution for graduates from tertiary education in the EU-27 by occurrence of a work experience at their highest level of education attained. It shows that in the broad group of graduates from tertiary-level education, in the EU as a whole, the biggest proportion by age is made up by 30- to 34-year-olds, followed by those aged 25 to 29 and then by those aged 20 to 24. This holds across various subgroups. The age distribution is very similar across the following subgroups: graduates with apprenticeship experiences, graduates with traineeship experience and graduates with no work experience during their highest education attained. For the graduates who worked outside the curriculum, the age distribution diverges slightly from the other types of work experience, and particularly for the

youngest and oldest age group. Among tertiary education graduates who worked outside the curriculum, proportionally more graduates belong to the oldest age group (55%) and proportionally fewer graduates belong to the youngest age group (6%).

Figure 20. **Age group distribution of graduates with a tertiary-level qualification (ISCED 5-8) by type work experience at their highest education attained, including traineeships and apprenticeships (EU-LFS AHM 2016 def.), EU-27 (graduates aged 20-34, not in formal education), 2016**



NB: 'Traineeship': traineeships (EU-LFS AHM 2016 def.).
 'Apprenticeship': apprenticeships (EU-LFS AHM 2016 def.).
 'Work outside curriculum': work outside curriculum.
 'No work experience': no work experience during highest level of education.
 Data: Table A.5 in Annex 6.
 Source: Eurostat, EU-LFS AHM 2016 microdata; own calculations.

Figure 21 displays country-level data on the share of 25- to 29-year-old tertiary-level graduates with a traineeship experience and relevant comparisons with other graduates at tertiary level of education. It shows that, among graduates from tertiary level education, in 13 countries as well as for the EU-27 as a whole, the share of 25- to 29-year-olds is similar in the subgroup of those with a traineeship experience and in the subgroup of those without work experience during their tertiary education. In 10 countries, 25- to 29-year-olds are overrepresented among tertiary education graduates with a traineeship, as compared to other tertiary graduates who did not acquire any work experience in

highest education attained. Only in five countries (Bulgaria, Ireland, Latvia, Portugal and Slovakia) is there an underrepresentation.

Figure 22 displays country-level data on the share of 30- to 34-year-olds among tertiary-level graduates. It focuses on tertiary level graduates with a traineeship experience and offers relevant comparisons with other subgroups of graduates at tertiary level of education. Among tertiary-level graduates in 15 countries and in the EU-27 on average, the share of those aged 30 to 34 is similar in the subgroup of those with a traineeship experience and in the subgroup of those with no work experience during their highest education. Only in four countries (Bulgaria, Ireland, Portugal and Latvia) is there an overrepresentation of 30- to 34-year-olds in the subgroup of tertiary-level graduates with a traineeship experience compared to the subgroup of graduates without work experience. In eight countries, the 30- to 34-year-olds are underrepresented in the subgroup of tertiary-level graduates with a traineeship experience, compared to other graduates who did not acquire any work experience during tertiary education.

Figure 23 displays country-level data on the share of 25- to 29-year-olds among tertiary level graduates, focusing on the subgroup of those with an apprenticeship experience and offering comparisons with other subgroups of graduates at the same level of education. It shows that for the subgroup of tertiary-level graduates with an apprenticeship experience and the subgroup of tertiary-level graduates without working experience during their study, the share of 25- to 29-year-olds is similar in the EU-27 as a whole, and in eight countries. In five countries (Belgium, Cyprus, France, Poland and Switzerland), an overrepresentation of 25- to 29-year-olds is found and in six countries (Denmark, Greece, Italy, Norway, Slovenia and Spain), an underrepresentation is observed.

Finally, Figure 24 displays country-level data on the share of 30- to 34-year-olds among tertiary-level graduates, focusing on the subgroup of those with apprenticeship and offering comparisons with other subgroups of graduates at the same level of education. It shows that, among tertiary-level graduates, in 11 countries and the EU-27 as a whole, for the subgroup of those with an apprenticeship experience and for the subgroup of those with no work experience during tertiary education, the share of 30- to 34-year-olds is almost on par. These 11 countries are: Belgium, Ireland, Cyprus, Lithuania, Luxemburg, Hungary, the Netherlands, Austria, Slovakia, Finland and Sweden. In seven countries, an overrepresentation can be found, in contrast to three countries with an underrepresentation.

3.3.2.3. *Summary of findings at the EU-27 level*

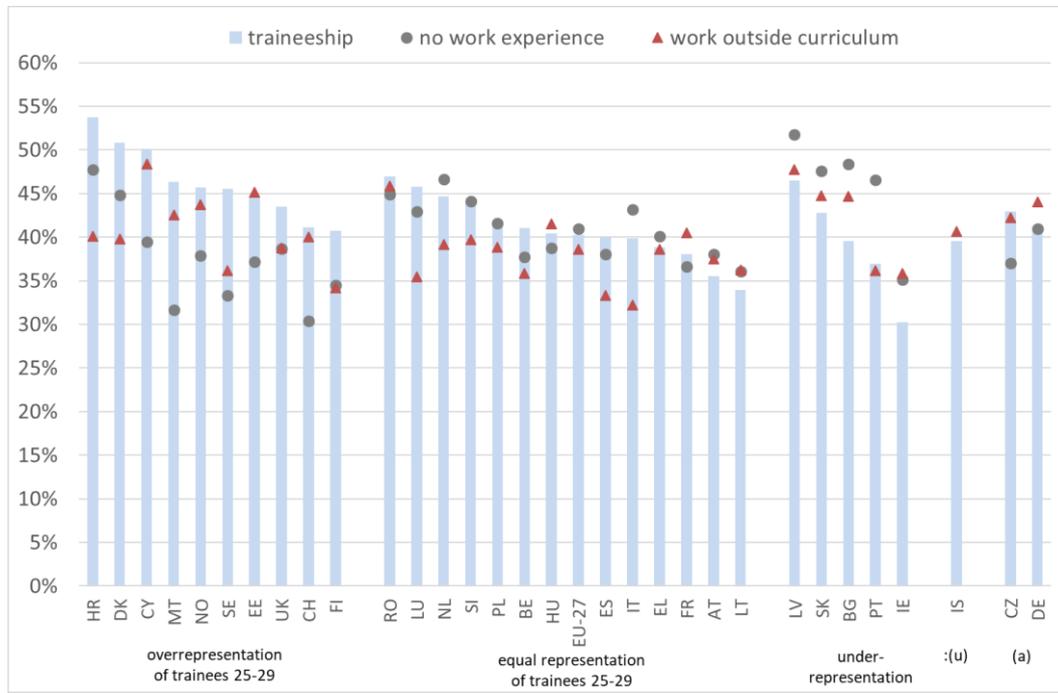
Among graduates from medium-level vocational education with traineeship experience, it is estimated that 28% are between 20 and 24 years old, 35% are between 25 and 29 years old and 36% are between 30 and 34 years old. The share of the youngest age group is slightly smaller and the shares of the remaining older age groups slightly higher for graduates from medium-level vocational education with an apprenticeship experience:

- (a) 23% are 20- to 24-year-olds;
- (b) 37% are between 25 and 29 years old;
- (c) 40% are 30 to 34.

Among graduates from medium-level vocational education, the age distribution of those with traineeship experience programmes is not dissimilar to the age distribution of those who did not acquire any work experience during it. Also, among graduates from medium-level vocational education, the age distribution of those with an apprenticeship experience and the age distribution of those with no work experience are not that different.

The age distributions are also very similar across subgroups of tertiary-level education graduates: those with traineeships types of experiences, those with apprenticeships types of experiences and those with no work experience during tertiary education, with the share of 30- to 34-year-olds ranging between 48% and 50% of graduates, the share of those aged 25 to 29 ranging between 40% to 41%, and the share of those aged 20 to 24 ranging from 9% to 11%.

Figure 21. **Share of 25- to 29-year-olds, among graduates with a tertiary level qualification (ISCED 5-8) by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience, (graduates aged 20-34 not in formal education), 2016**



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

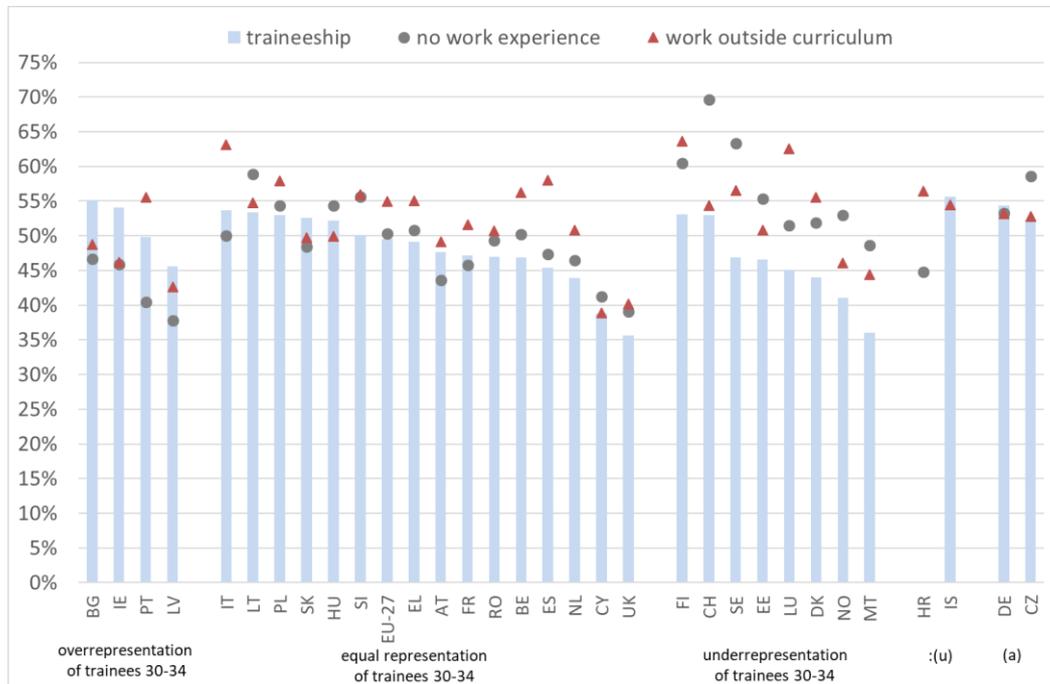
Labels: 'Traineeship': traineeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: Low reliability data on no work experience, too low to be published: IS. Low reliability data on no work experience, flagged publication: MT, LU, SI, HU. Low reliability data on work outside the curriculum, flagged publication: HR, MT, LU. Low reliability data on traineeships, flagged publication: HR, MT.

Data: Table A.5 in Annex 6.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

Figure 22. Share of 30- to 34-year-olds, among graduates with a tertiary-level qualification (ISCED 5-8) by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

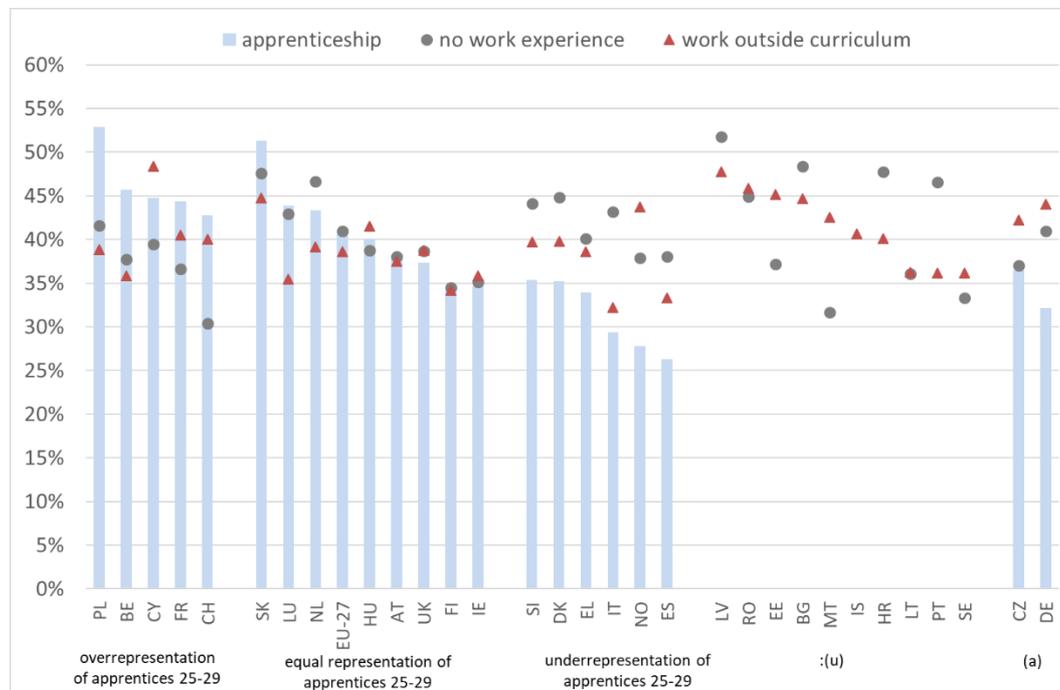
Labels: 'Traineeship': traineeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: Low reliability data on no work experience, too low to be published: IS. Low reliability data on traineeships, too low to be published: HR. Low reliability data on no work experience, flagged publication: HR, LU, MT, SI. Low reliability data on work outside the curriculum, flagged publication: HR, LU, MT. Low reliability data on traineeships, flagged publication: MT.

Data: Table A.5 in Annex 6.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

Figure 23. Share of 25- to 29-year-olds, among graduates with a tertiary-level qualification (ISCED 5-8) by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

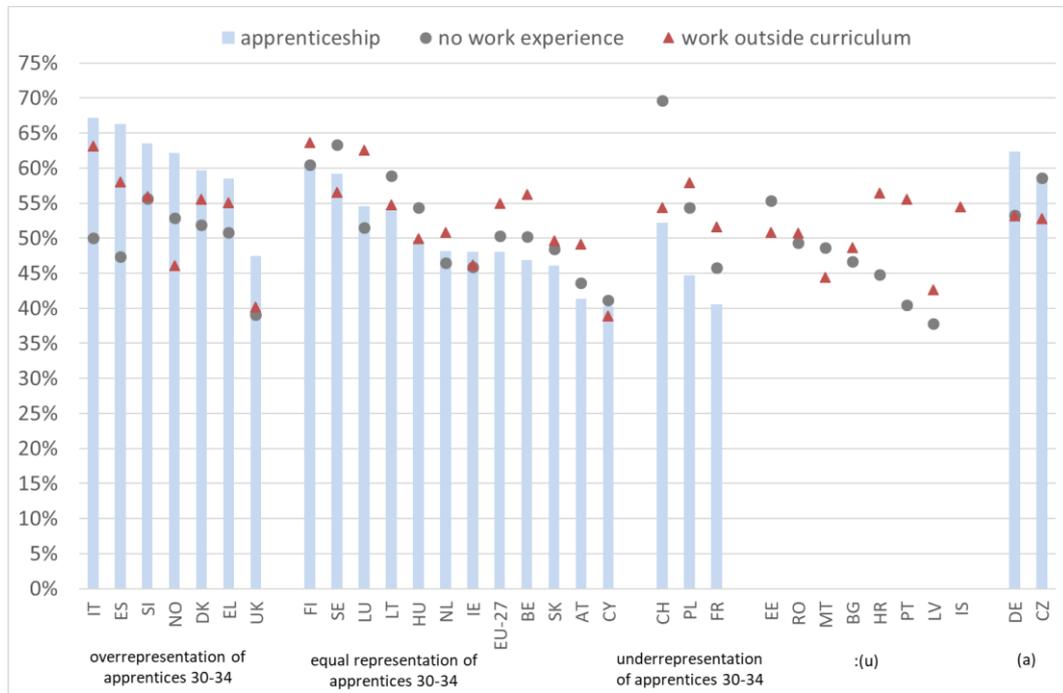
Labels: 'Apprenticeship': apprenticeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: Confidential data on apprenticeships: LV, PT. Low reliability data on apprenticeships, too low to be published: RO, EE, BG, MT, IS, HR, LT, SE. Low reliability data on no work experience, flagged publication: LU, HU, SI, MT. Low reliability data on work outside the curriculum, flagged publication: LU, HR, MT. Low reliability data on apprenticeships, flagged publication: CY, LU, SI, DK, IT, NO, IE.

Data: Table A.5 in Annex 6.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

Figure 24. Share of 30- to 34-year-olds, among graduates with a tertiary-level qualification (ISCED 5-8) by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

Labels: 'Apprenticeship': apprenticeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: No respondents available for apprenticeships: BG. Low reliability data on no work experience, too low to be published: IS. Low reliability data on apprenticeships, too low to be published: EE, HR, IS, LV, MT, PT, RO. Low reliability data on no work experience, flagged publication: HR, LU, MT, SI. Low reliability data on work outside the curriculum, flagged publication: HR, LU, MT. Low reliability data on apprenticeships, flagged publication: DK, CY, LT, LU, SI, SE.

Data: Table A.5 in Annex 6.

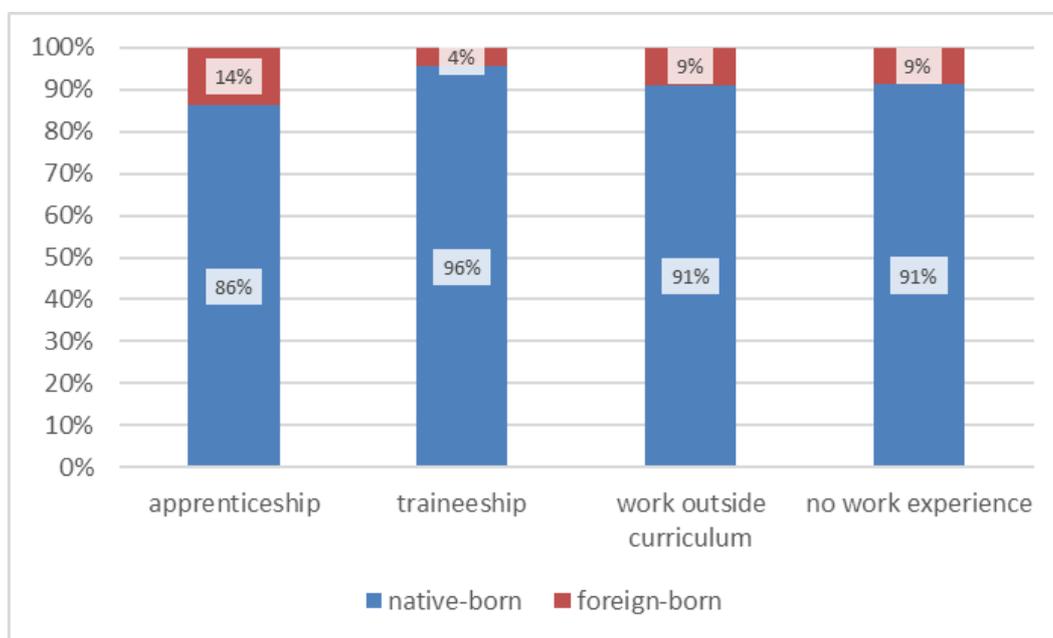
Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

3.3.3. Country of birth

3.3.3.1. Graduates from medium-level vocational education

Figure 25 shows the EU-level distribution by country of birth (native-born versus foreign-born) for graduates with a medium-level vocational qualification as their highest educational attainment, broken down by work experience at that level. The figure shows that in all subgroups, the share of the native-born is predominant. Across all subgroups, the share of the foreign-born is higher among medium-level vocational graduates with an apprenticeship experience (14%).

Figure 25. **Country of birth distribution (native-born and foreign-born) of graduates with at most a medium-level vocational qualification (ISCED 35, 45) by type of work experience at their highest education attained, including traineeships and apprenticeships (EU-LFS AHM 2016 def.), EU-27 (graduates aged 20-34, not in formal education), 2016**



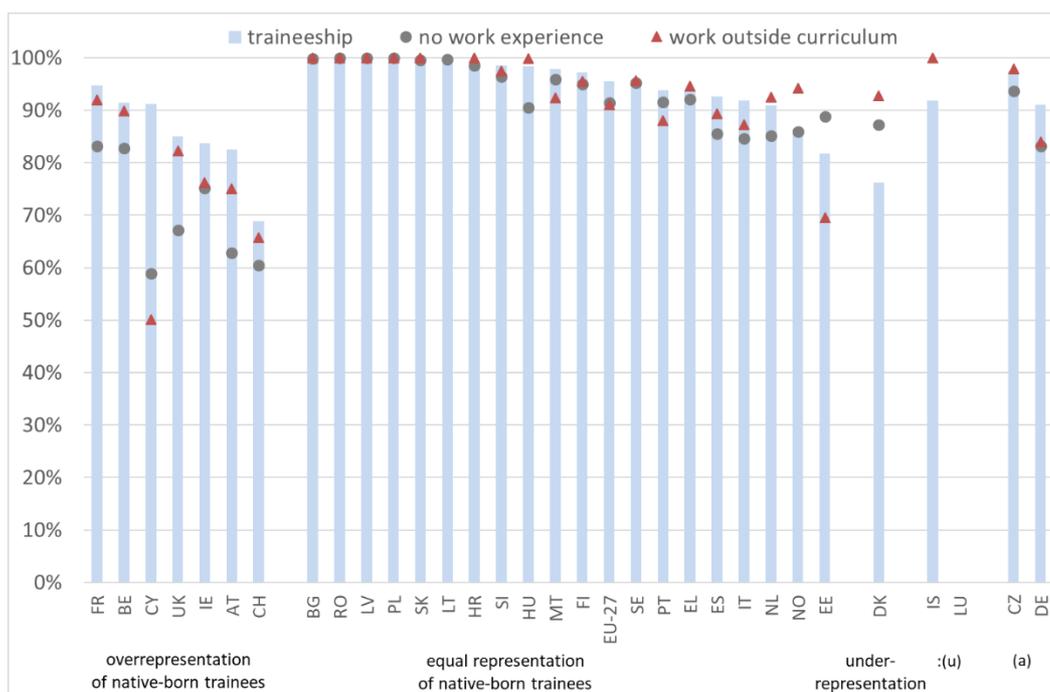
NB: 'Traineeship': traineeships (EU-LFS AHM 2016 def.).
 'Apprenticeship': apprenticeships (EU-LFS AHM 2016 def.).
 'Work outside curriculum': work outside curriculum.
 'No work experience': no work experience during highest level of education.
 Data: Table A.7 in Annex 8.

Source: Eurostat EU-LFS 2016 AHM microdata; own calculations.

Figure 26 displays country-level data for the share of native-born among graduates from medium-level vocational education, focusing on those with a traineeship experience and allowing comparisons with other subgroups. The figure shows that the share of native-born trainees with a degree of vocational medium-level education is higher than 90% in most countries: exceptions are Austria, Denmark, Estonia, Ireland, Norway, Switzerland and the United Kingdom. Among graduates from medium-level vocational education, in 19 countries as well as in the EU-27 as a whole, the share of the native-born is similar in the subgroup of those with traineeship experience and in the subgroup of those with no work experience during their highest education (medium-level vocational education). In seven countries (Austria, Belgium, Cyprus, France, Ireland, Switzerland, and United Kingdom), there is an overrepresentation of native-born traineeship graduates. Only in Denmark is an underrepresentation of more than 10% observed.

Figure 27 shows that in almost all countries the share of native born for medium-level vocational graduates with an apprenticeship experience is higher than 90%. Shares lower than 90% can be found in Austria, Cyprus, Estonia, Ireland Italy, Spain and Switzerland. In 14 countries and the EU-27 on average, there is a similar share of native born between the subgroup of medium-level vocational graduates with apprenticeship experience and in the subgroup of medium-level vocational graduates with no work experience during their highest education attained. In nine countries, native-born graduates are overrepresented in the subgroup of vocational medium-level graduates who were apprentices when compared to the subgroup of graduates who did not acquire any work experience in vocational medium-level education.

Figure 26. **Share of native-born among graduates with at most a medium-level vocational qualification (ISCED 35, 45) by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016**



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

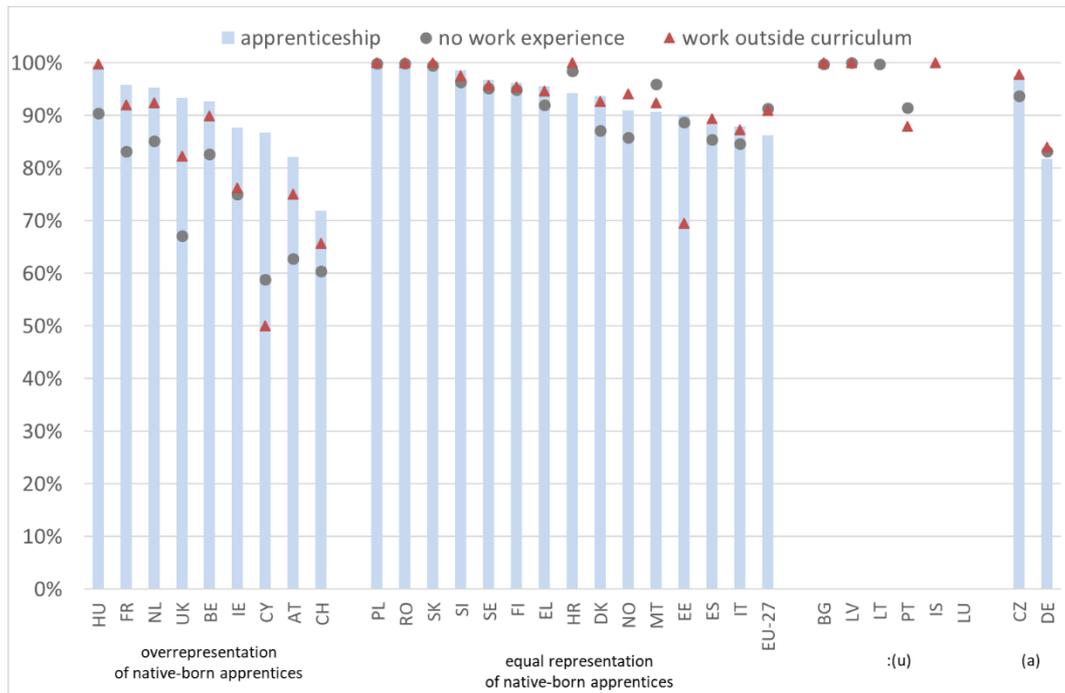
Labels: 'Traineeship': traineeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: Low reliability data on no work experience, too low to be published: IS, LU. Low reliability data on work outside the curriculum, too low to be published: LT, LU. Low reliability data on traineeships, too low to be published: LU. Low reliability data on work outside the curriculum, flagged publication: BG, EE, HR, LV, MT. Low reliability data on traineeships, flagged publication: DK, IS, MT, NO, CH.

Data: Table A.7 in Annex 8.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

Figure 27. **Share of native-born among graduates with at most a medium-level vocational qualification (ISCED 35, 45) by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016**



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

Labels: 'Apprenticeship': apprenticeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: No respondents available for apprenticeships: BG. Low reliability data on no work experience, too low to be published: IS, LU. Low reliability data on work outside the curriculum, too low to be published: LT, LU. Low reliability data on apprenticeships, too low to be published: LV, LT, PT, LU, IS. Low reliability data on work outside the curriculum, flagged publication: BG, EE, HR, LV, MT. Low reliability data on apprenticeships, flagged publication: EE, HR, MT, RO.

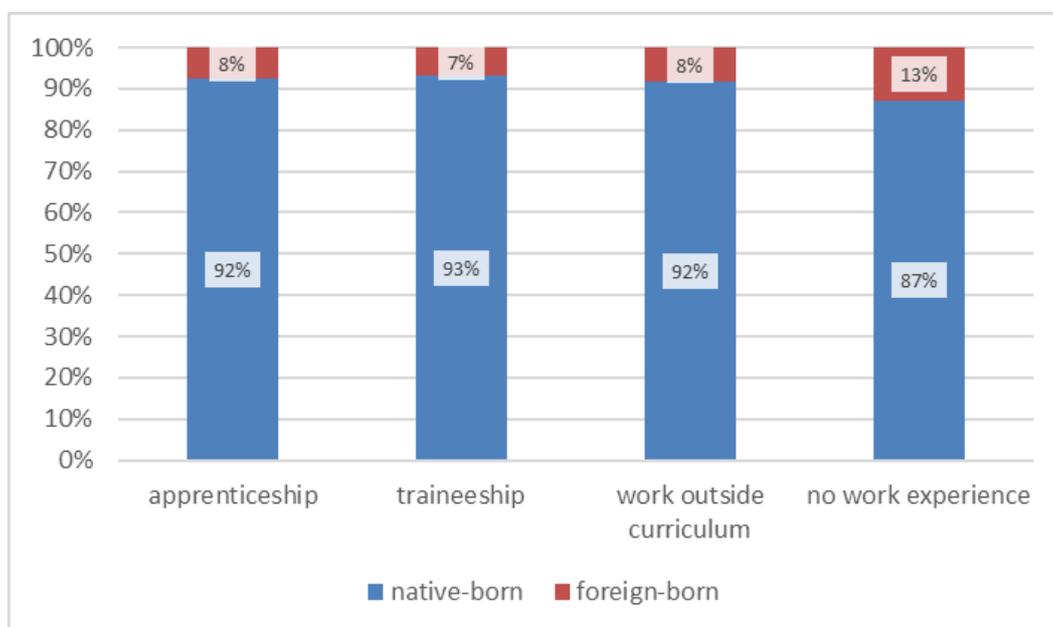
Data: Table A.7 in Annex 8.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

3.3.3.2. Graduates from tertiary education

Figure 28 shows the distribution by country of birth for tertiary-level graduates according to different subgroups created on the basis of their work experience at the highest level of education. The figure shows that, in the EU-27 as a whole, among graduates from tertiary-level education, the distribution by country of birth sees a large presence of the native-born. The distribution does not differ much across the subgroup of those with a traineeship experience, the subgroup of those with an apprenticeship experience and the subgroup of those with work experience outside the curriculum: the share of native-born ranges between 92% and 93%. The share of native-born at 87% is lower among tertiary education graduates with no work experience during their highest education.

Figure 28. **Country of birth distribution (native-born and foreign-born) of graduates with a tertiary level qualification (ISCED 5-8) by type of work experience at their highest education attained, including traineeships and apprenticeships (EU-LFS AHM 2016 def.), EU-27 (graduates aged 20-34, not in formal education), 2016**



NB: 'Traineeship': traineeships (EU-LFS AHM 2016 def.).

'Apprenticeship': apprenticeships (EU-LFS AHM 2016 def.).

'Work outside curriculum': work outside curriculum.

'No work experience': no work experience during highest level of education.

Data: Table A.7 in Annex 8.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

At country level, Figure 29 shows that, among tertiary-level graduates, there is a similar share of the native-born in the subgroup of those with a traineeship experience and in the subgroup of those without work experience in 19 countries and in the EU-27. Among tertiary-level graduates, an overrepresentation of native-born in the subgroup of those with a traineeship experience, compared to the subgroup of those with no work experience, is found in nine countries (Austria, Denmark, Finland, France, Luxemburg, Malta, Norway, Sweden and Switzerland).

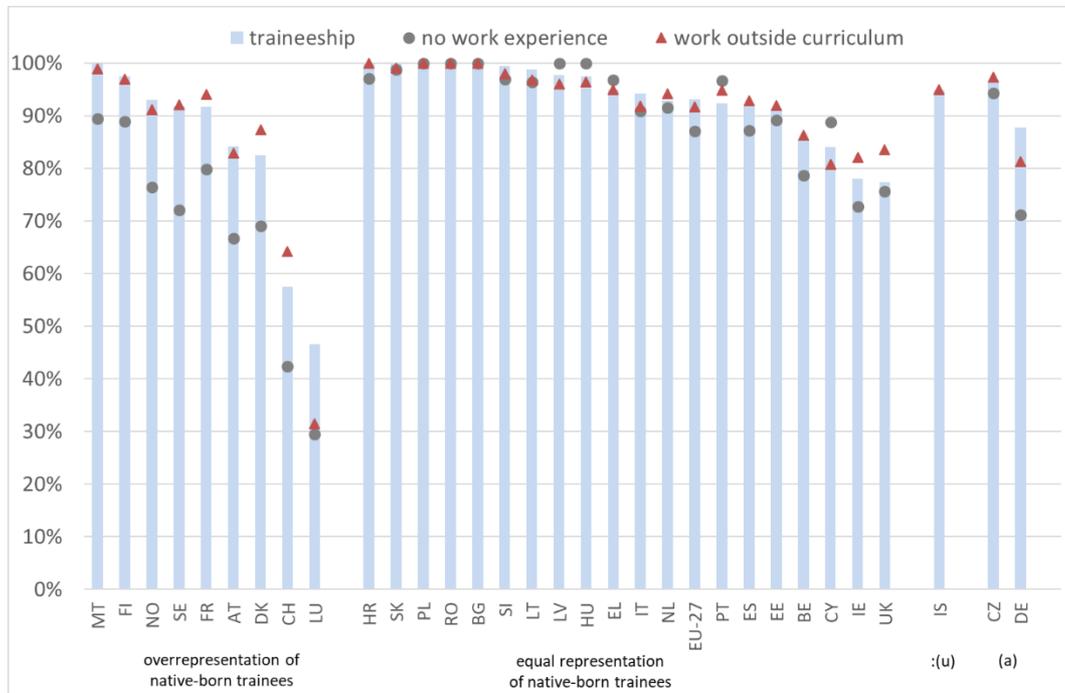
Figure 30 shows that there is a similar representation of native-born in the subgroup of tertiary-level graduates with an apprenticeship experience as other tertiary-level graduates without work experience in most countries (n=15) and in the EU-27 on average. An overrepresentation is found in Austria, Denmark, Finland, France, Norway, Switzerland and the United Kingdom. Only in Belgium is the share of native-born among tertiary-level graduates with an apprenticeship experience much smaller than the share of native-born in the subgroup of tertiary-level graduates with no work experience.

3.3.3.3. *Summary of findings at the EU-27 level*

For graduates with at most a medium-level vocational education, 86% with an apprenticeship experience and 96% with a traineeship experience are native-born. The corresponding share of native-born for those who did not acquire any work experience during medium-level vocational education (signalling that, among medium-level apprentices, the presence of foreign-born is somehow higher) is 91%. However, differences are small, the percentages of native-born are largely predominant and, overall, relatively similar between the subgroups of those with a traineeship experience, those with an apprenticeship experience and those with no work experience.

Among graduates from tertiary education, the share of native-born graduates is similar between the subgroups of those with traineeship and apprenticeship experience (respectively 93% and 92%). Although close overall, these shares are higher than the proportion of native born among tertiary-level graduates who did not acquire any work experience (87%), signalling that, among tertiary-level graduates with work-based learning experiences, the presence of foreign-born is somehow lower.

Figure 29. Share of native-born among graduates with a tertiary-level qualification (ISCED 5-8) by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

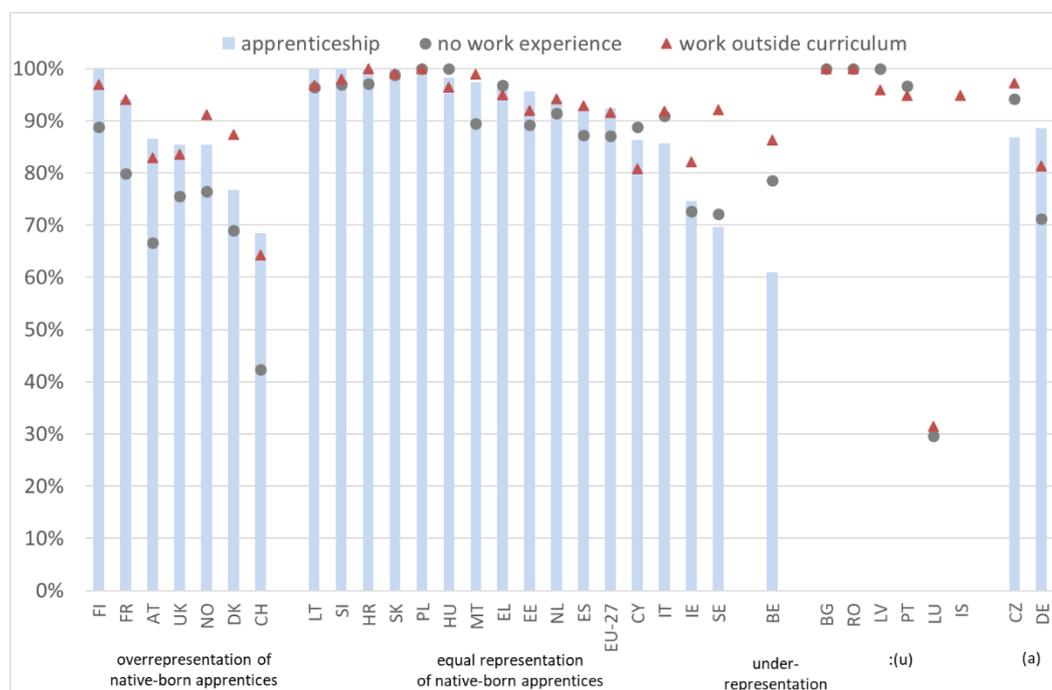
Labels: 'Traineeship': traineeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: Low reliability data on no work experience, too low to be published: IS. Low reliability data on no work experience, flagged publication: LU. Low reliability data on work outside the curriculum, flagged publication: LU. Low reliability data on apprenticeships, flagged publication: HR.

Data: Table A.7 in Annex 8.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations

Figure 30. **Share of native-born among graduates with tertiary-level qualification (ISCED 5-8) by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016**



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

Labels: 'Apprenticeship': apprenticeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: No respondents available for apprenticeships: BG. Low reliability data on no work experience, too low to be published: IS. Low reliability data on apprenticeships, too low to be published: IS, LV, LU, PT, RO. Low reliability data on no work experience, flagged publication: LU. Low reliability data on work outside the curriculum, flagged publication: LU. Low reliability data on apprenticeships, flagged publication: EE, HR, MT, SI, SE.

Data: Table A.7 in Annex 8.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

CHAPTER 4.

The labour market outcomes of work-based learning: a descriptive analysis

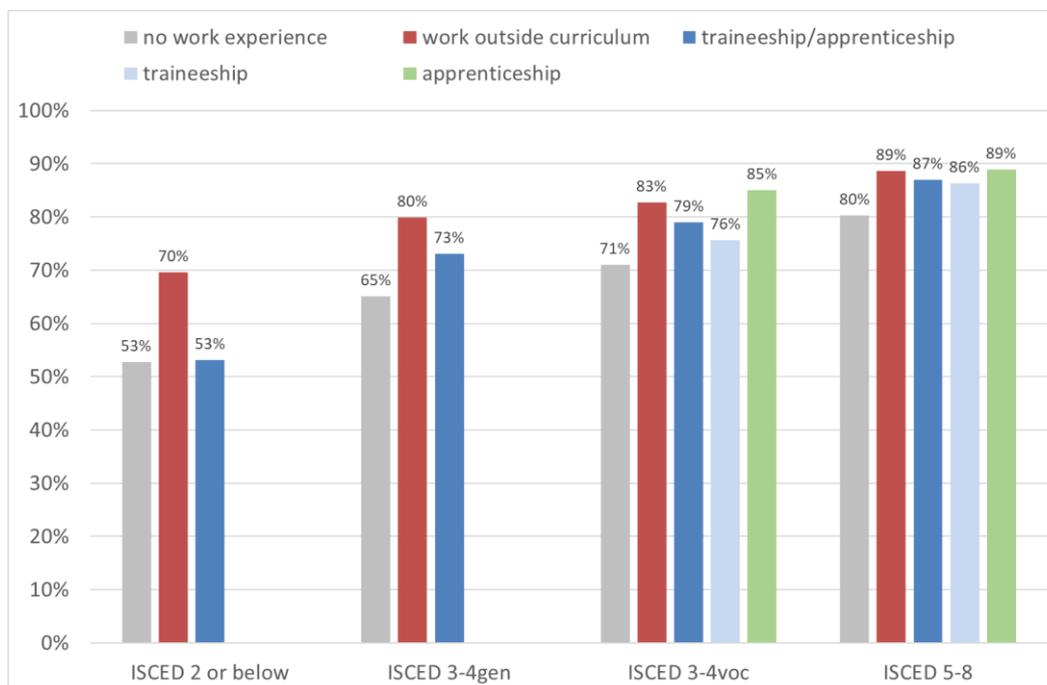
Chapter 4 uses a descriptive approach to analyse the labour market outcomes of work-based learning. It focuses on four main variables: employment status; for those in employment, the non-precariousness of the job; work in a skills intensive occupation; and the presence/absence of a search for another job. In Annex 14, tables with descriptive values for some additional variables are presented, measuring other aspects of employment quality: involuntary temporary and part-time jobs and participation in training.

4.1. Employment status

Figure 31 displays the employment rate of respondents aged 20 to 34 who were not in formal education, broken down by work experience/work-based learning and ISCED level for the EU-27.

Figure 31 shows that, at all broad ISCED levels analysed, the employment rate of graduates who had work experiences, either as part of the curriculum (WBL) or outside of it, exceeds the employment rate of graduates who did not acquire any work experience during their highest education attained. The employment rates for graduates with a work experience outside the curriculum tend to be slightly higher than those for graduates with a work experience as part of the curriculum (apprenticeships and traineeship considered altogether). This difference shrinks as educational attainment increases. At any level where a distinction can be reliably calculated, the employment rates for graduates with an apprenticeship type of WBL are higher than those for graduates with a traineeship type of WBL. The employment rate for graduates with an apprenticeship type of WBL is higher than that for graduates with a work experience outside the curriculum in medium-level vocational education and on par with it in tertiary-level education. Overall results suggest that employment rates are higher for graduates with a work experience at their highest level of education, either as part of it or even outside the curriculum. As far as WBL is concerned, employment rates are higher for those with an apprenticeship experience than for those with a traineeship type, reflecting the more structured nature of WBL in the form of apprenticeships.

Figure 31. **Employment rates of graduates by highest education attained and type of work experience at that level, including traineeships and apprenticeships (EU-LFS AHM 2016 def.), EU-27 (graduates aged 20-34, not in formal education), 2016**



NB: 'No work experience': no work experience during highest level of education.

'Work outside curriculum': work experience outside curriculum.

'Traineeship/apprenticeship': traineeships/apprenticeships (EU-LFS AHM 2016 def.).

'Traineeship': traineeships (EU-LFS AHM 2016 def.).

'Apprenticeship': apprenticeships (EU-LFS AHM 2016 def.).

'ISCED 2 or below': low-level education, i.e. at most lower secondary education.

'ISCED 3-4 gen': general medium-level education.

'ISCED 3-4 voc': vocational medium-level education.

'ISCED 5-8': tertiary education.

Data: Table A.9 in Annex 10.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculation.

The employment rate for graduates from medium-level vocational education is shown at country level in Figure 32 (with a focus on those with a traineeship experience) and Figure 33 (with a focus on those with an apprenticeship experience). The same is done in Figure 34 (traineeship) and Figure 35 (apprenticeship) for graduates from tertiary education. A table with the underlying data can be found in the annexes (Table A9 in Annex 10). Data in each figure support a comparison of the employment rates of graduates with traineeship (or apprenticeship) experience with the corresponding employment rate of graduates with the same education who did not acquire any work experience during their highest education attained (no participation in traineeships or apprenticeships, and

no work experience outside the curriculum at the highest education attained). Countries have been clustered in the following groups:

- (a) considerable employment premium: where the employment rate of traineeship/apprenticeship graduates exceeds the employment rate of graduates with no work experience during their highest education attained by more than 10%;
- (b) small employment premium: where the employment rate of traineeship/apprenticeship graduates exceeds the employment rate of graduates with no work experience during their highest education attained by 5-10%;
- (c) no employment premium: where the employment rate of traineeship/apprenticeship graduates differs from the employment rate of graduates with no work experience during their highest education attained by less than 5%;
- (d) small employment penalty: where the employment rate of traineeship/apprenticeship graduates falls below the employment rate of graduates with no work experience during their highest education attained by 5-10%;
- (e) considerable employment penalty: where the employment rate of traineeship/apprenticeship graduates falls below the employment rate of graduates with no work experience during their highest education attained by more than 10%.

4.1.1. Graduates from medium-level vocational education

In most countries, among graduates with a medium-level vocational qualification as their highest, those with a WBL traineeship experience had a higher employment rate than those who did not acquire any work experience (Figure 32). Compared to the latter, graduates with a traineeship enjoyed a significant employment premium (above 10%) in nine countries. In six countries, the employment premium was small (between 5 and 10%), as was the case for the EU-27 average. In nine other countries, no employment premium for traineeship graduates was present. In Hungary and Romania, graduates from medium-level vocational education with a traineeship, suffered an employment penalty between 5 and 10%. In Greece, the employment penalty amounted to 11%. In most countries, among graduates from medium-level vocational education, those that worked outside the curriculum have a higher employment rate (employment premium) compared to their counterparts with a traineeship. Only in Cyprus, Norway, Portugal, Sweden and Switzerland do traineeship graduates have an employment premium, compared to graduates that worked outside the curriculum.

Figure 33 focuses on the employment rates for graduates from medium-level vocational education who had a WBL experience in the form of an apprenticeship. In most countries, apprenticeship graduates with a medium-level vocational

qualification had a higher employment rate than those who did not acquire any work experience during it. Compared to the latter, apprenticeship graduates enjoyed a considerable employment premium (above 10%) in 13 countries. This also holds for the EU-27 average. Italy, Spain and Finland record the highest premiums with respectively 38, 36 and 35%. In two countries, Malta and Slovakia, the employment premium was small (between 5 and 10%). In seven other countries, there was no considerable employment premium for VET graduates with an apprenticeship at medium level of education. No employment penalties were found. In most countries with employment premiums, graduates from medium-level vocational education (ISCED 3-4) with an apprenticeship also enjoy an employment premium when compared to graduates that worked outside the curriculum.

4.1.2. Graduates from tertiary education

Figure 34 shows that in most countries, among graduates with a tertiary-level qualification as their highest, those with a traineeship experience had a higher employment rate than those who did not acquire any work experience during it. Traineeship graduates enjoyed a significant employment premium (above 10%) in seven countries. Italy and Sweden record the highest premiums with respectively 21 and 19%. In nine countries, the employment premium was smaller (between 5 and 10%). This also holds for the EU-27 average. In 12 other countries, there was no considerable employment premium for traineeship graduates at tertiary level. Only in Croatia did graduates from tertiary-level education with a traineeship suffer an employment penalty, at 7%. Further, at tertiary level of education, the employment rate of graduates that worked outside the curriculum during their studies exceeds the employment rate of those without any work experience. So, working during studies strengthens the employment potential of graduates, both inside and outside the curriculum.

Figure 35 presents the employment premiums and penalties for apprenticeships at tertiary level. Apprenticeship graduates enjoy a considerable employment premium (above 10%) in 14 countries. This also holds for the EU-27 average. Greece, Finland and Sweden record the highest premiums with respectively 32%, 23% and 21%. In six countries, the employment premium was small (between 5 and 10%). In four other countries (Belgium, Luxembourg, Hungary, and Poland), there was no considerable employment premium for apprenticeship graduates at tertiary level. No employment penalties were found.

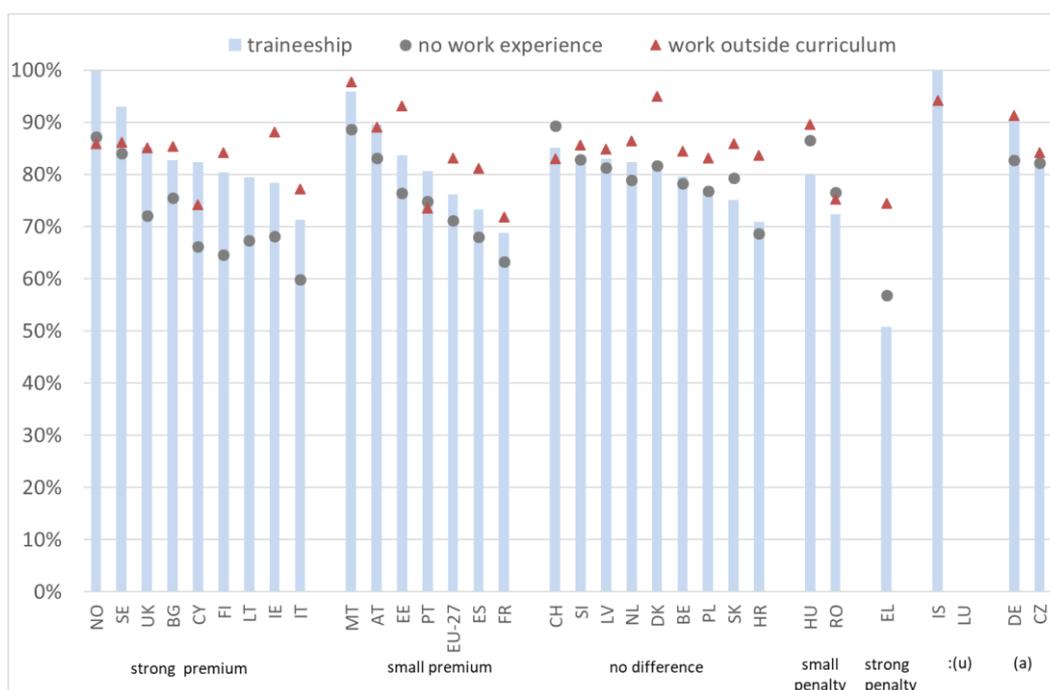
4.1.3. Summary of findings at the EU-27 level

A total of 76% of graduates from medium-level vocational education with a WBL traineeship experience were found to be employed. The employment rate was nine

percentage points higher for medium-level vocational education graduates who participated in apprenticeships. Compared to graduates with no work experience during their medium-level vocational education, in the EU as a whole and in most countries, a small employment premium is estimated for traineeship graduates (5% on EU average) and a considerable one for apprenticeship graduates (14% on EU average).

Among tertiary education graduates, 86% of those with a traineeship experience and 89% of those with an apprenticeship experience were employed. In comparison to tertiary education graduates with no work experience during their studies, traineeship graduates have a relatively small employment premium (6% on EU average) and apprenticeship graduates have a bigger and considerable employment premium (9%).

Figure 32. **Employment rates of graduates with at most a medium-level vocational qualification (ISCED 35, 45) by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016**



NB: (u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

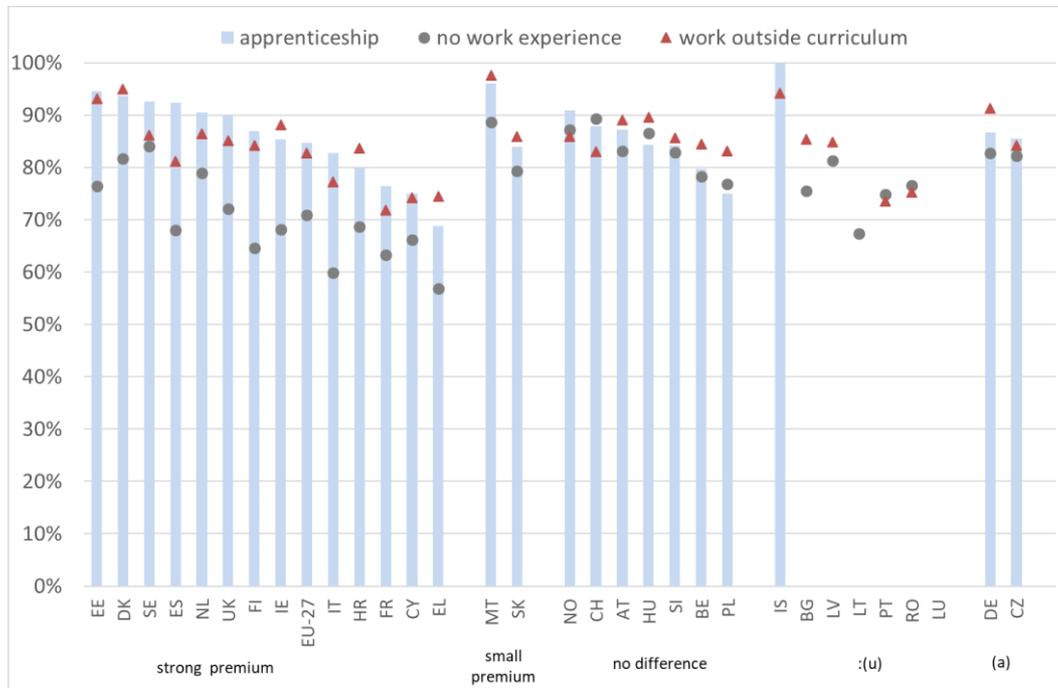
Labels: 'Traineeship': traineeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: Low reliability data on no work experience, too low to be published: IS, LU. Low reliability data on work outside the curriculum, too low to be published: LU. Low reliability data on traineeships, too low to be published: LU. Low reliability data on work outside the curriculum, flagged publication: BG, MT, EE, LV, HR. Low reliability data on traineeships, flagged publication: NO, MT, DK.

Data: Table A.9 in Annex 10.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

Figure 33. **Employment rates of graduates with at most a medium-level vocational qualification (ISCED 35, 45) by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016**



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

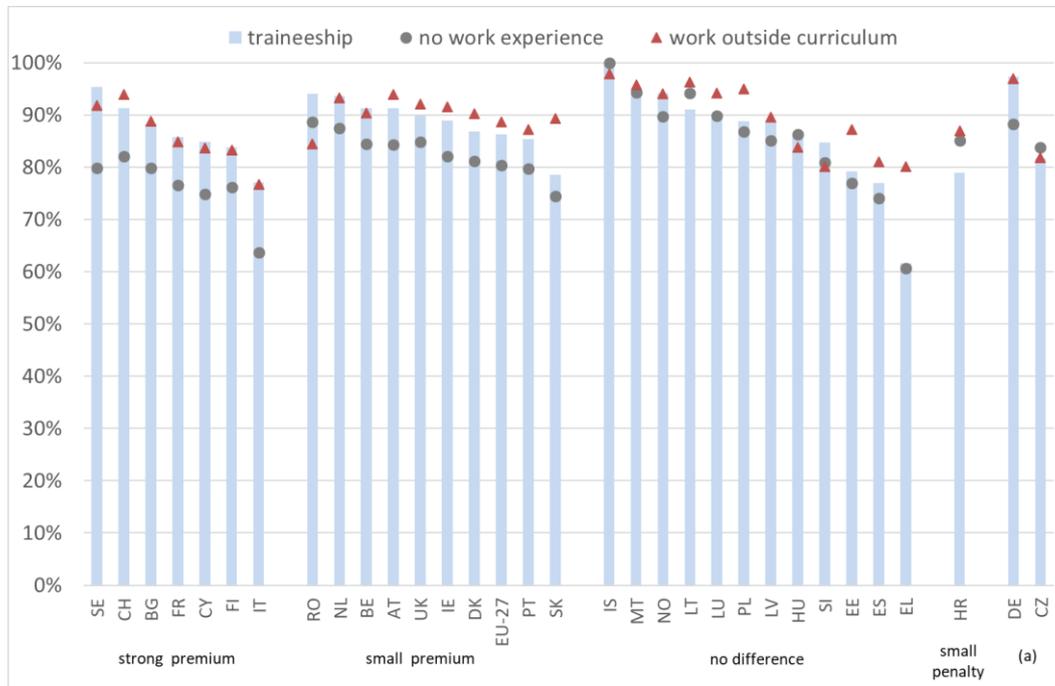
Labels: 'Apprenticeship': apprenticeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: No respondents available for apprenticeships: BG. Low reliability data on no work experience, too low to be published: IS, LU. Low reliability data on work outside the curriculum, too low to be published: LT, LU. Low reliability data on apprenticeships, too low to be published: LV, LT, PT, RO, LU. Low reliability data on no work experience, flagged publication: MT. Low reliability data on work outside the curriculum, flagged publication: EE, HR, MT, BG, LV. Low reliability data on apprenticeships, flagged publication: EE, HR, MT.

Data: Table A.9 in Annex 10.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

Figure 34. **Employment rates of graduates with a tertiary-level qualification (ISCED 5-8) by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016**



NB: (u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

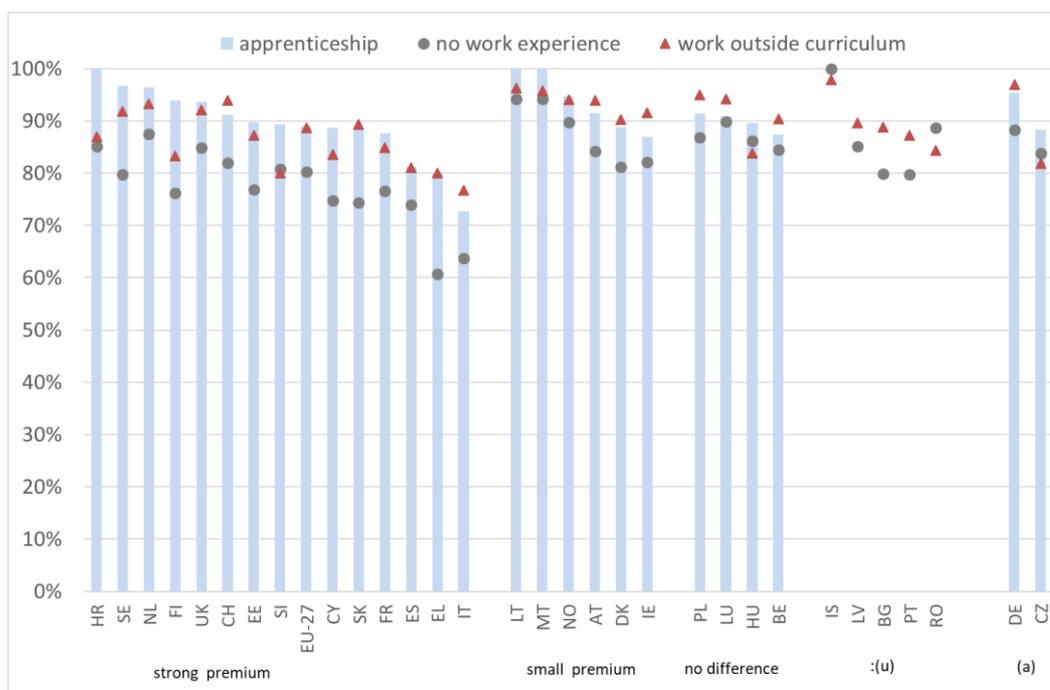
Labels: 'Traineeship': traineeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: Low reliability data on traineeships, flagged publication: HR.

Data: Table A.9 in Annex 10.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

Figure 35. **Employment rates of graduates with a tertiary-level qualification (ISCED 5-8) by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education), 2016**



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

Labels: 'Apprenticeship': apprenticeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: No respondents available for apprenticeships: BG. Low reliability data on apprenticeships, too low to be published: IS, LV, PT, RO. Low reliability data on apprenticeships, flagged publication: HR, EE, SI, MT.

Data: Table A.9 in Annex 10.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

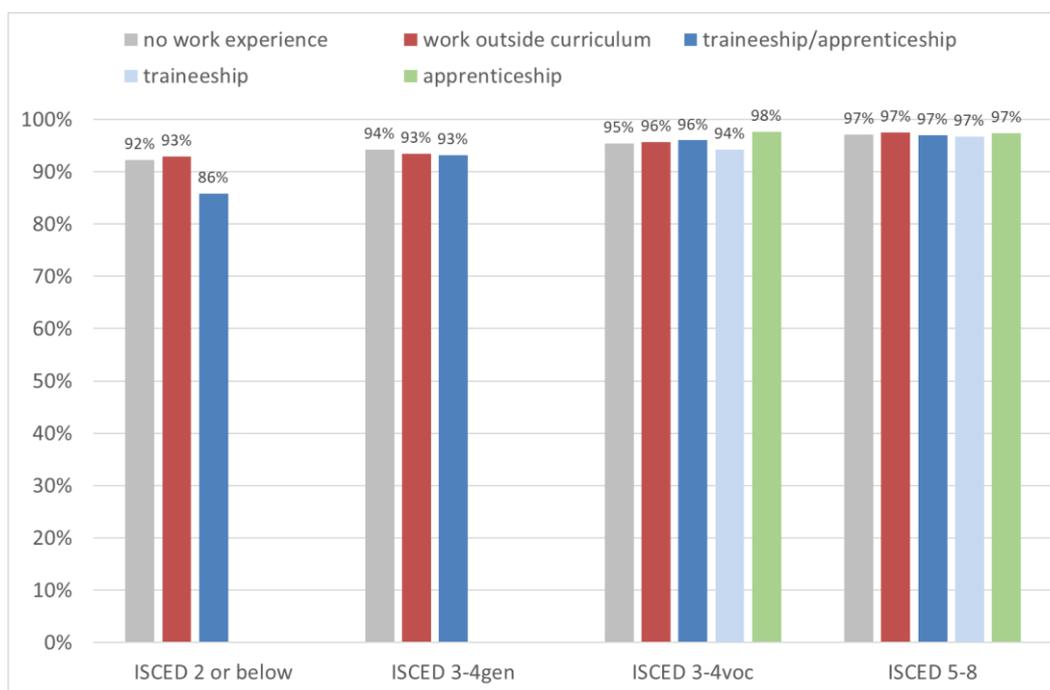
4.2. Non-precariousness of employment

Analysing employment status makes it possible to determine to what extent work experience and work-based learning facilitates transition into employment. It is also important to analyse the effects on employment quality.

Precarious employment is defined as having a working contract of three months or less. This definition is also used by Eurostat (2020). To avoid flagging issues related to the low numbers of observations and the data publication thresholds (Annex 11), and stress a possibly positive outcome, this section presents and discusses figures on non-precariousness of employment, i.e. the share of graduates with a contract of more than three months, including indefinite contracts.

Figure 36 presents the share of graduates with a non-precarious job by their highest education attained and work experience in the EU-27. The figure highlights that the share of graduates with a non-precarious job is more than 90% in all combinations of educational attainment and work experience, with the exception of some graduates with low levels of education. Such shares tend to grow as educational attainment increases. In medium-level vocational education, the share of graduates with a non-precarious job is 98% for those having had an apprenticeship experience (three percentage points higher than for those without a work experience during their education of that type) and 94% for those having had a traineeship (almost on par with that for those without a work experience during their medium-level vocational education). For tertiary level education, the share of graduates with a non-precarious job is around 97%, with very small differences by work experience (less than one percentage points).

Figure 36. **Share of graduates with permanent contract or temporary contract of at least three months by highest education attained and type of work experience at that level, including traineeships and apprenticeships (EU-LFS AHM 2016 def.), EU-27 (graduates aged 20-34, not in formal education and employed), 2016**



NB: 'No work experience': no work experience during highest level of education.
 'Work outside curriculum': work experience outside curriculum.
 'Traineeship/apprenticeship': traineeships/apprenticeships (EU-LFS AHM 2016 def.).
 'Traineeship': traineeships (EU-LFS AHM 2016 def.).
 'Apprenticeship': apprenticeships (EU-LFS AHM 2016 def.).
 'ISCED 2 or below': low-level education, i.e. at most lower secondary education.
 'ISCED 3-4 gen': general medium-level education.

'ISCED 3-4 voc': vocational medium-level education.

'ISCED 5-8': tertiary education.

Data: Table A.10 in Annex 11.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

For graduates from medium-level vocational education, and at country level, the shares of graduates in a non-precarious job are displayed in Figure 37 (with a focus on those with a traineeship experience) and in Figure 38 (with a focus on those with an apprenticeship experience). The same is done for graduates from tertiary education in Figure 39 (focus on traineeship) and Figure 40 (focus on apprenticeship). A table with the underlying data can be found in Annex 11. To consider the benefit of traineeships or apprenticeships, in each figure, the percentages of graduates with a contract of more than three months is displayed for graduates with a traineeship (or apprenticeship) and for graduates with a similar educational attainment who did not acquire any work experience during their highest level of education attained (no participation in traineeships and apprenticeships, and no work experience outside the curriculum). Based on specific comparisons, countries have been clustered in the following groups:

- (a) considerable non-precariousness premium: where the share of those with a contract of more than three months is higher for graduates with a traineeship (or apprenticeship) experience than for graduates with no work experience during the highest education attained and where this difference is by more than 5%;
- (b) small non-precariousness premium: where the share of those with a contract of more than three months is higher for graduates with a traineeship (or apprenticeship) experience than for graduates with no work experience during the highest education attained and where this difference is 2.5-5%;
- (c) no difference: where the shares of those with a contract of more than three months calculated among graduates with a traineeship (or apprenticeship) and among graduates with no work experience during the highest education attained differ by less than 2.5%;
- (d) small non-precariousness penalty: where the share of those with a contract of more than three months is lower for graduates with a traineeship (or apprenticeship) experience than for graduates with no work experience during their highest education attained and where this difference is 2.5-5%;
- (e) considerable non-precariousness penalty: where the share of those with a contract of more than three months is lower for graduates with a traineeship (or apprenticeship) experience than for graduates with no work experience during the highest education attained and where this difference is by more than 5%.

4.2.1. Graduates of vocational medium-level education

Figure 37 shows that, among graduates from medium-level vocational education (ISCED 3-4 VOC), the share of those with a contract of more than three months is higher than 90% in almost all countries (except for France, Croatia and Poland), regardless of having work experience. In 23 countries and in the EU-27 on average, traineeship graduates with a medium-level vocational qualification have non-precariousness shares similar to those of graduates with no work experience during the highest level of education (medium-level vocational). There is a small non-precariousness premium for trainees in Denmark, Slovenia and Sweden. Only in Croatia do traineeship graduates with a medium-level vocational qualification (ISCED 3-4 VOC) suffer a non-precariousness penalty, at 13%.

Among graduates from medium-level vocational qualification with an apprenticeship experience, the share of those with a contract of more than three months in Figure 38 is higher than for those with a traineeship experience in Figure 37. In 14 countries, the difference in the share of those having a contract of more than three months among apprenticeship graduates and among graduates with no work experience during the same type of education is less than 2.5%. This is also the case for the EU-27 as a whole. A non-precariousness premium of more than 5% can be observed for Spain and Croatia; a premium between 2.5 and 5% is found in Italy and Finland. In three countries, apprenticeship graduates from medium-level vocational education have a non-precariousness penalty when compared to graduates with no work experience during the same type of education. This penalty is small in the Netherlands and Poland, and considerable in Belgium.

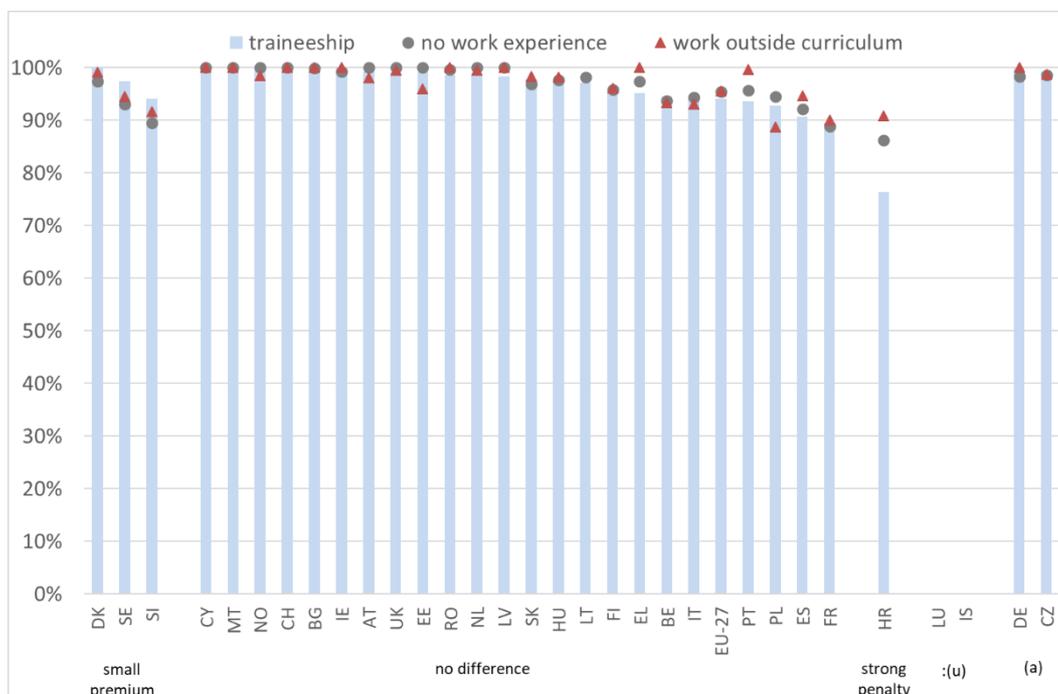
4.2.2. Graduates of tertiary education

For tertiary-level education, Figure 39 and Figure 40 indicate that in almost all countries, and in the EU-27 as a whole, the share of graduates with a non-precarious job is high and with no remarkable difference between those with an apprenticeship or traineeship, and those with no work experience at their highest education. Compared to tertiary graduates with no work experience during their tertiary education, there is a large non-precariousness premium in Croatia for tertiary graduates with a traineeship, and a small penalty in Slovenia, Spain and Switzerland (Figure 38). Compared to tertiary graduates with no work experience during their tertiary education, tertiary graduates with an apprenticeship experience (Figure 39) enjoy a large non-precariousness premium in Croatia and Finland; a small premium in Spain, Italy and Sweden; and a small penalty in Denmark, Hungary and Slovenia (Figure 40).

4.2.3. Summary of findings at the EU-27 level

The share of medium-level vocational education graduates in a non-precarious job is 94% for those with a traineeship experience and 98% for those with an apprenticeship experience. This share is at 97% for traineeship and apprenticeship graduates from tertiary education. Both for medium-level vocational graduates and for tertiary level graduates, the differences between traineeship/apprenticeship graduates and graduates who acquired no work experience at their highest education are very small.

Figure 37. **Share of graduates with at most a medium-level vocational qualification (ISCED 35, 45) having a permanent contract or a temporary contract of more than three months by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education and employed), 2016**



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

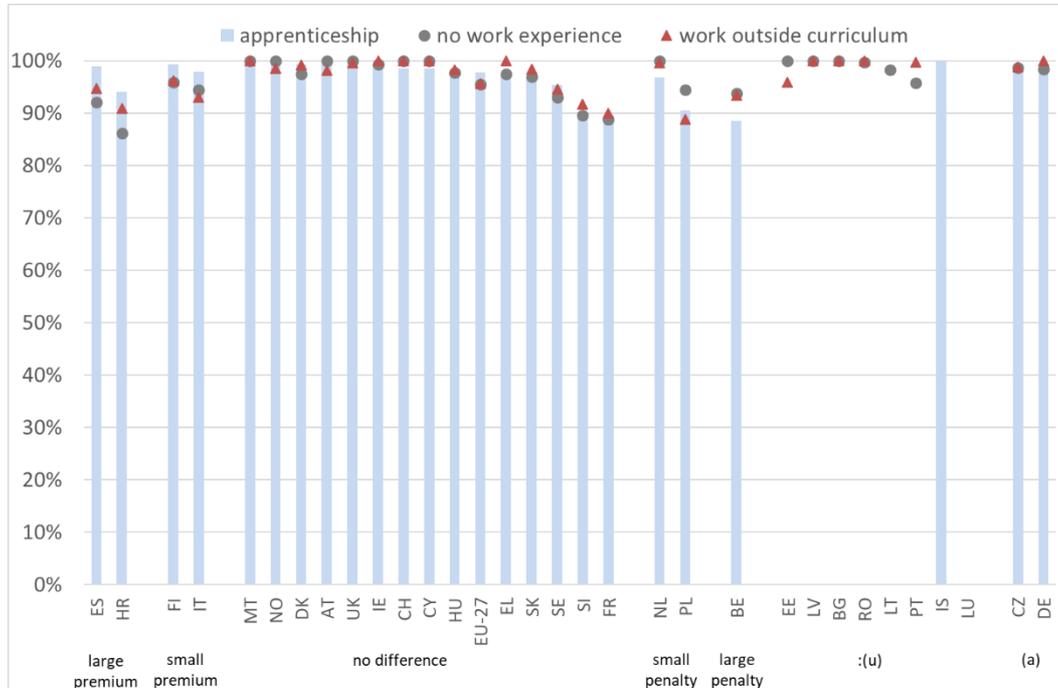
Labels: 'Traineeship': traineeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: Low reliability data on work outside the curriculum, too low to be published: LT, LU. Low reliability data on traineeships, too low to be published: LU. Low reliability data on no work experience, flagged publication: MT. Low reliability data on work outside the curriculum, flagged publication: HR, MT, BG, EE, LV. Low reliability data on traineeships, flagged publication: HR, MT, NO, CH, DK.

Data: Table A.10 in Annex 11.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

Figure 38. Share of graduates with at most a medium-level vocational qualification (ISCED 35, 45) having a permanent contract or a temporary contract of more than three months by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education and employed), 2016



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

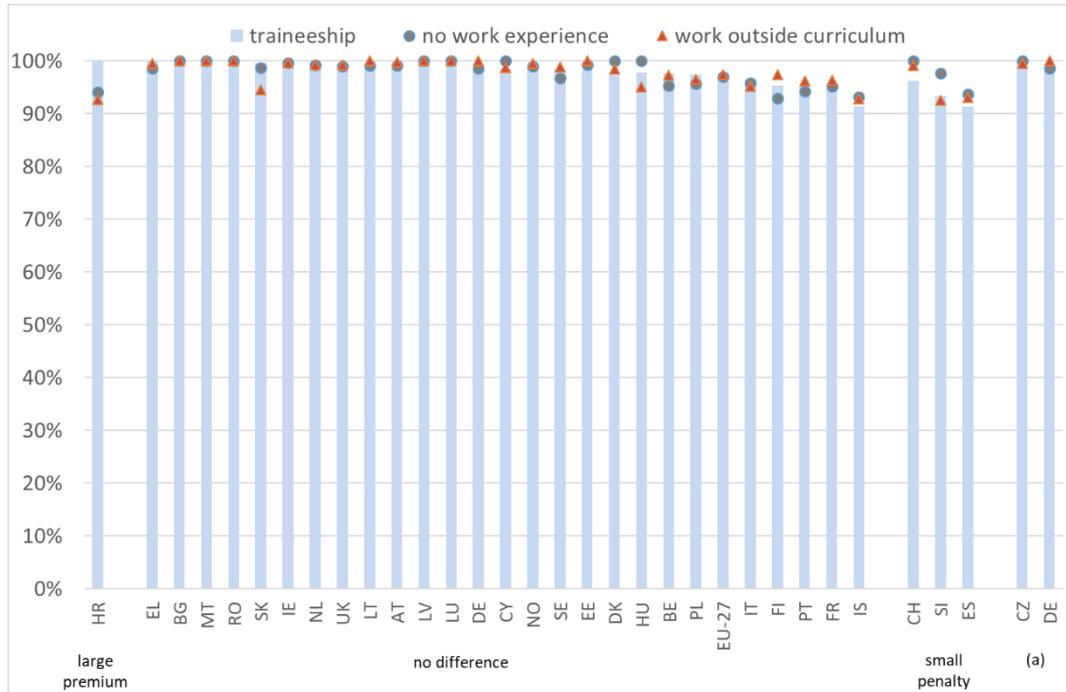
Labels: 'Apprenticeship': apprenticeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: No respondents available for apprenticeships: BG. Confidential data for no work experience: IS. Low reliability data on no work experience, too low to be published: LU. Low reliability data on work outside the curriculum, too low to be published: LT, IS, LU. Low reliability data on apprenticeships, too low to be published: EE, LV, RO, LT, PT, LU. Low reliability data on no work experience, flagged publication: MT. Low reliability data on work outside the curriculum, flagged publication: MT, HR, EE, LV, BG. Low reliability data on apprenticeships, flagged publication: MT, CY, HR, SI, IS.

Data: Table A.10 in Annex 11.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

Figure 39. Share of graduates with a tertiary-level qualification (ISCED 5-8) having a permanent contract or a temporary contract of more than three months by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education and employed), 2016



NB: (u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

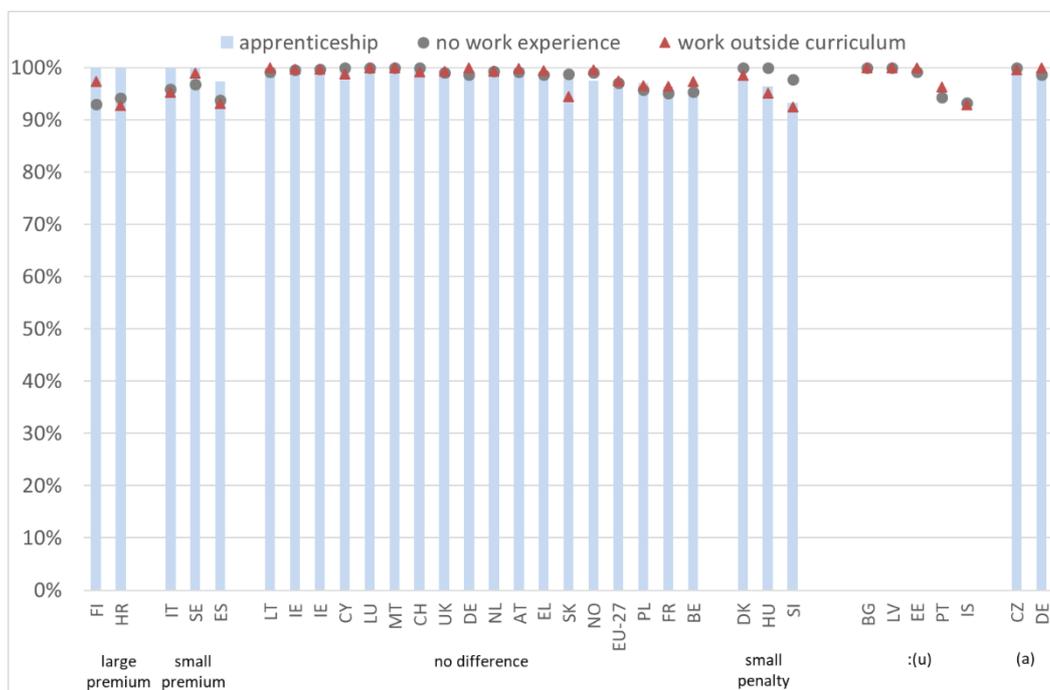
Labels: 'Traineeship': traineeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: Low reliability data on no work experience, flagged publication: SI. Low reliability data on work outside the curriculum, flagged publication: HR. Low reliability data on traineeships, flagged publication: HR.

Data: Table A.10 in Annex 11.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

Figure 40. **Share of graduates with a tertiary-level qualification (ISCED 5-8) having a permanent contract or a temporary contract of more than three months by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education and employed), 2016**



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

Labels: 'Apprenticeship': apprenticeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: No respondents available for apprenticeships: BG. Low reliability data on apprenticeships, too low to be published: LV, EE, PT, IS. Low reliability data on no work experience, flagged publication: SI. Low reliability data on work outside the curriculum, flagged publication: HR. Low reliability data on apprenticeships, flagged publication: HR, LT, MT, SI.

Data: Table A.10 in Annex 11.

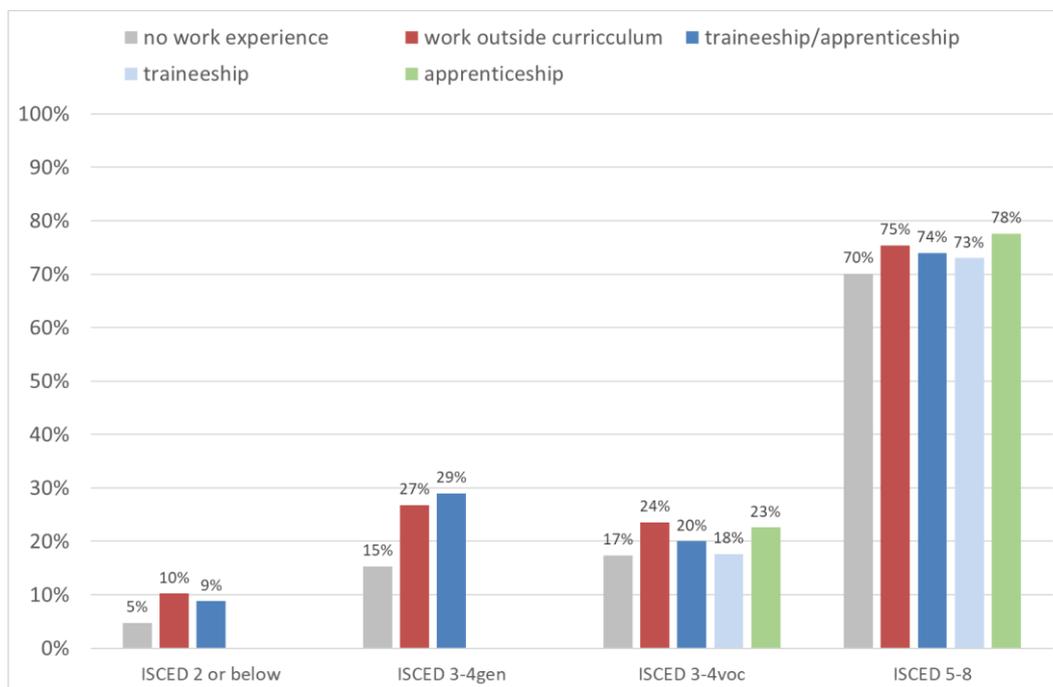
Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

4.3. Work in occupations with high skills intensity

To derive indications on the skills intensity of the jobs performed, and based on ISCO classification, a dichotomous variable has been constructed that indicates whether the main job performed by a graduate belongs to one of the first three major occupational groups of the classification. These are characterised by high skills intensity (these are managers, professionals, technicians and associate professionals, standing at skills levels 3 and 4 of the classification). The share of employed graduates performing jobs belonging to these groups is then calculated.

Figure 41 shows the share of graduates in a high-skilled job by their highest education level and occurrence of work experience during it in the EU-27. For all education levels, the share of graduates in a high-skilled job is the lowest for those who did not acquire any work experience during their highest education. Among graduates of medium-level general education, 15% of those with no work experience had a high-skilled job; this share was 12 percentage points higher for graduates who worked outside the curriculum and 14 percentage points higher for graduates who had a traineeship or apprenticeship experience as part of it. For medium-level vocational education, the share of graduates in a high-skilled job was the highest for those who worked outside the curriculum (24%) and for those who had an apprenticeship experience (23%) as part of it. For medium-level vocational education, the share of graduates in a high-skilled job was the lowest for those without work experience during their medium-level vocational education (17%), and for those with a traineeship experience as part of it (18%). The share of graduates in a high-skilled job was highest among tertiary education graduates. Among them, we can observe that this share was the highest for apprenticeship graduates (78%), followed by graduates who worked outside the curriculum (75%) during their tertiary-level education and for those who had traineeship as part of it (73%). The lowest share was found for tertiary education graduates with no work experience during their education (70%).

Figure 41. **Share of graduates in a highly skilled job by highest education attained and type of work experience at that level, including traineeships and apprenticeships (EU-LFS AHM 2016 def.), EU-27 (graduates aged 20-34, not in formal education and employed), 2016**



NB: 'No work experience': no work experience during highest level of education.

'Work outside curriculum': work experience outside curriculum.

'Traineeship/apprenticeship': traineeships/apprenticeships (EU-LFS AHM 2016 def.).

'Traineeship': traineeships (EU-LFS AHM 2016 def.).

'Apprenticeship': apprenticeships (EU-LFS AHM 2016 def.).

'ISCED 2 or below': low-level education, i.e. at most lower secondary education.

'ISCED 3-4 gen': general medium-level education.

'ISCED 3-4 voc': vocational medium-level education.

'ISCED 5-8': tertiary education.

Data: Table A.11 in Annex 12.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

For medium-level vocational education (ISCED 3-4 VOC) and at country level, the shares of graduates in highly skilled jobs are displayed in Figure 42 (with a focus on those with a traineeship experience) and in Figure 43 (with a focus on those with an apprenticeship experience). The same is done for tertiary level education in Figure 44 (focus on traineeship) and Figure 45 (focus on apprenticeship). A table with the underlying data can be found in Annex 12.

To consider the possible benefit of traineeships or apprenticeships, in each figure the percentage of graduates working in a high-skilled job is displayed for graduates with a traineeship (or apprenticeship) experience and for graduates with a similar educational attainment who did not acquire any work experience during their highest level of education attained (no participation in traineeships and

apprenticeships, and no work experience outside the curriculum). Based on specific comparisons, countries have been clustered in the following groups:

- (a) considerable high-skilled job premium: where the share of those with a high-skilled job is higher for graduates with a traineeship (or apprenticeship) experience than for graduates without any work experience during their highest education attained and where this difference is more than 10%;
- (b) small high-skilled job premium: where the share of those with a high-skilled job is higher for graduates with a traineeship (or apprenticeship) experience than for graduates without any work experience during their highest education attained and where this difference is by 5-10%;
- (c) no difference: where the share of those working in a highly skilled job for graduates with a traineeship (or apprenticeship) experience and for those with no work experience during their highest education attained differ by less than 5%;
- (d) small high-skilled job penalty: where the share of those with a highly skilled job is lower for graduates with a traineeship (or apprenticeship) experience than for graduates with no work experience during their highest education attained and where this difference is by 5-10%;
- (e) considerable high-skilled job penalty: where the share of those with a highly skilled job is lower for graduates with a traineeship (or apprenticeship) experience than for graduates with no work experience during their highest education attained and where this difference is more than 10%.

4.3.1. Graduates from vocational medium-level education

Figure 42 shows that for graduates from medium-level vocational education with a traineeship experience, the share of those working in a high-skilled job is lower than 20% in most countries, except for, Austria, the Netherlands, Norway, Switzerland and the United Kingdom. In 12 countries, the share of those working in a highly skilled job is considerably higher for traineeship graduates with a medium-level vocational education (ISCED 3-4 VOC) than for other graduates from the same type of education with no work experience during their medium-level vocational education. In five countries (Estonia, Latvia, Hungary, the Netherlands and Slovakia), a considerable penalty is found for traineeship graduates from medium-level vocational education compared to their counterparts for medium-level vocational education without work experience during it. In Poland and the EU-27 on average, the difference between those with a traineeship and those without any work experience is negligible.

Figure 43 focuses on findings for apprenticeships: among graduates from medium-level vocational education in four countries (Greece, the Netherlands,

Slovenia and United Kingdom) and in the EU-27 as a whole, the share of those working in a highly skilled job is considerably higher for those who had an apprenticeship experience compared to their counterparts without such work experience. In six countries (Austria, Hungary, Norway, Poland, Slovakia and Switzerland), apprenticeship graduates have a significant penalty. In Denmark and Spain, the differences between apprenticeship graduates and graduates without work experience are relatively small.

4.3.2. Graduates from tertiary education

Figures 44 and 45 show the results for tertiary education graduates. The shares of tertiary-level graduates with a traineeship or apprenticeship graduates who worked in a high-skilled job is higher than 70% in most countries. For traineeship graduates, this share is lower than 70% in Greece, Spain, France, Cyprus, Lithuania, Austria, Romania and Slovenia. For apprenticeship graduates, this share is lower than 70% in Greece, Spain and Lithuania.

Figure 44 shows that among tertiary-level graduates in 16 countries, those with a traineeship experience tend to work more frequently in a highly skilled job than those without work experience during their tertiary education. This premium is higher than 10% in 12 countries, and between 5% and 10% in four countries. However, in eight countries and in the EU-27 on average, the difference between traineeship graduates and graduates without work experience is small. A penalty is observed in Spain, France, Lithuania and Romania.

Figure 45 reveals that in 12 countries and in the EU-27 as a whole, tertiary-level graduates with an apprenticeship experience more frequently tend to work in a high-skilled job than graduates with no work experience during their tertiary education (premium of more than 5%). In six countries, the differences between apprenticeship graduates and graduates without work experience are relatively small. In Greece, Lithuania, Malta and Norway a penalty can be observed for apprenticeship graduates compared to graduates with no work experience.

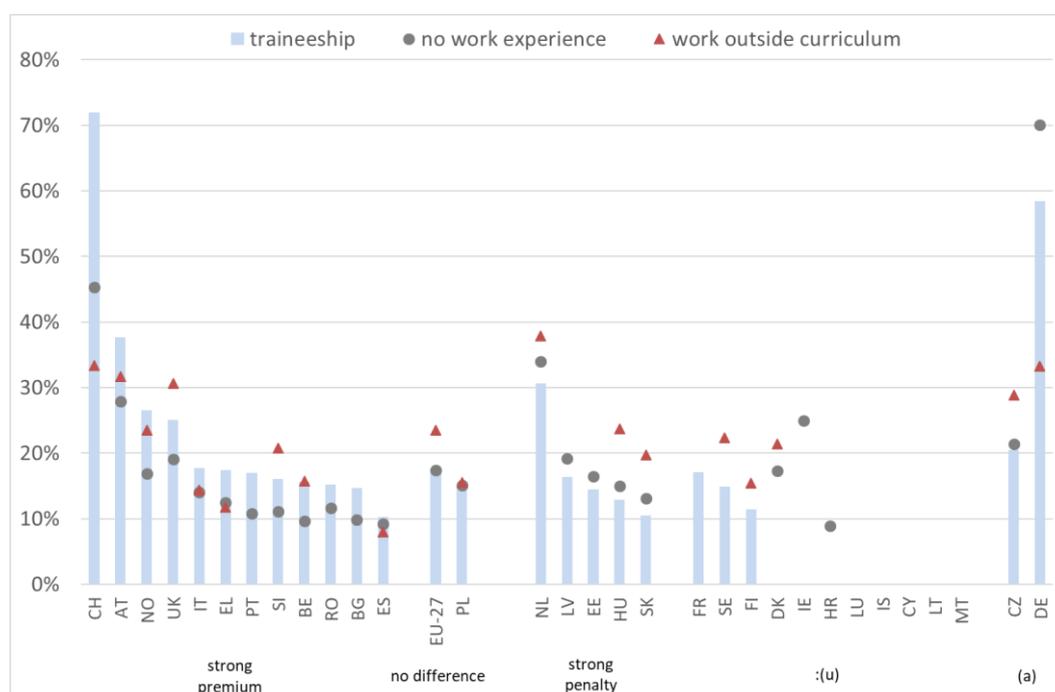
4.3.3. Summary of findings at the EU-27 level

In the EU as a whole, among graduates from medium-level vocational education, the share of those in a high-skilled job is estimated at 18% for graduates with traineeship experience and 23% for graduates with an apprenticeship experience. The corresponding share for graduates from vocational medium-level education with no work experience during it is estimated at 17%, implying a negligible difference compared to traineeship graduates, and a premium by 6% for apprenticeship graduates.

The share of those in a high-skilled job is estimated at 73% for tertiary-level graduates with a traineeship experience and at 78% for tertiary-level graduates

with an apprenticeship experience; both values are higher than the corresponding share for tertiary education graduates who acquired no work experience during studies (only 70% working in a high-skills job). Compared to this last group, results are more favourable for apprenticeship graduates (gap by 8%) than for those with a traineeship (gap by 3%).

Figure 42. **Share of graduates with at most a medium-level vocational qualification (ISCED 35, 45) working in a highly skilled job by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education and employed), 2016**



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

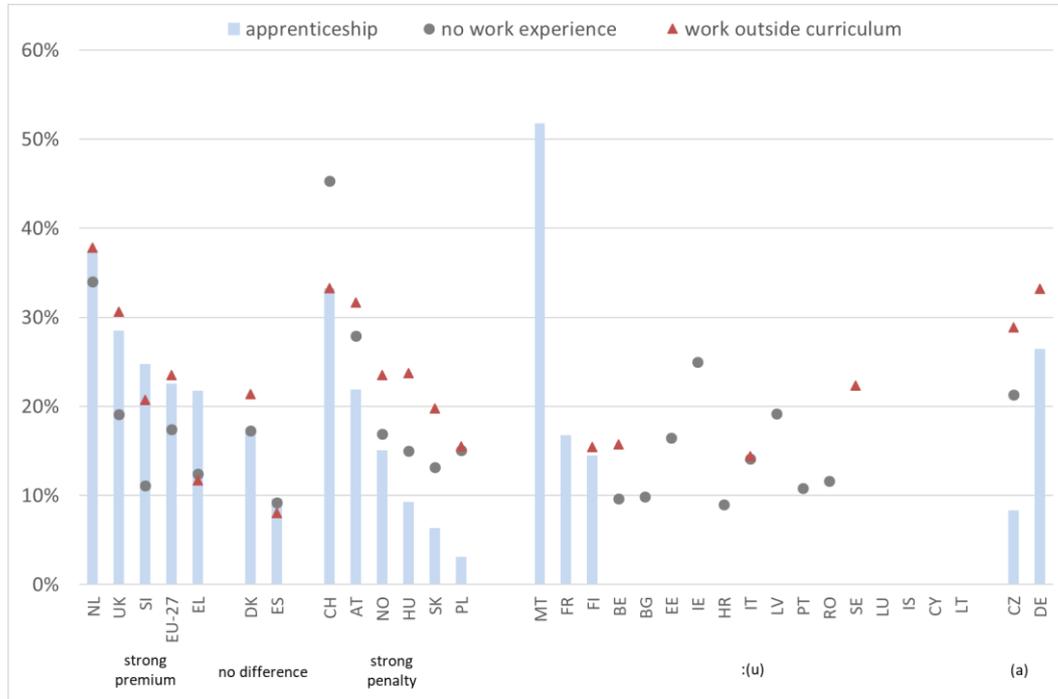
Labels: 'Traineeship': traineeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: Confidential data for no work experience: IS. Confidential data for work outside the curriculum: BG, CY, LV, LT. Confidential data for traineeships: DK, CY. Low reliability data on no work experience, too low to be published: FR, CY, LT, LU, MT, FI, SE. Low reliability data on work outside the curriculum, too low to be published: EE, IE, FR, HR, IS, LU, MT, PT, RO. Low reliability data on traineeships, too low to be published: IE, HR, IS, LT, LU, MT. Low reliability data on no work experience, flagged publication: DK, EE, HR, LV, HU, SI, CH. Low reliability data on work outside the curriculum, flagged publication: BE, DK, EL, ES, AT, PL, SI, SK, FI, CH. Low reliability data on traineeships, flagged publication: BG, EE, EL, LV, NO, SI, CH.

Data: Table A.11 in Annex 12

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

Figure 43. **Share of graduates with at most a medium-level vocational qualification (ISCED 35, 45) working in a highly skilled job by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education and employed), 2016**



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

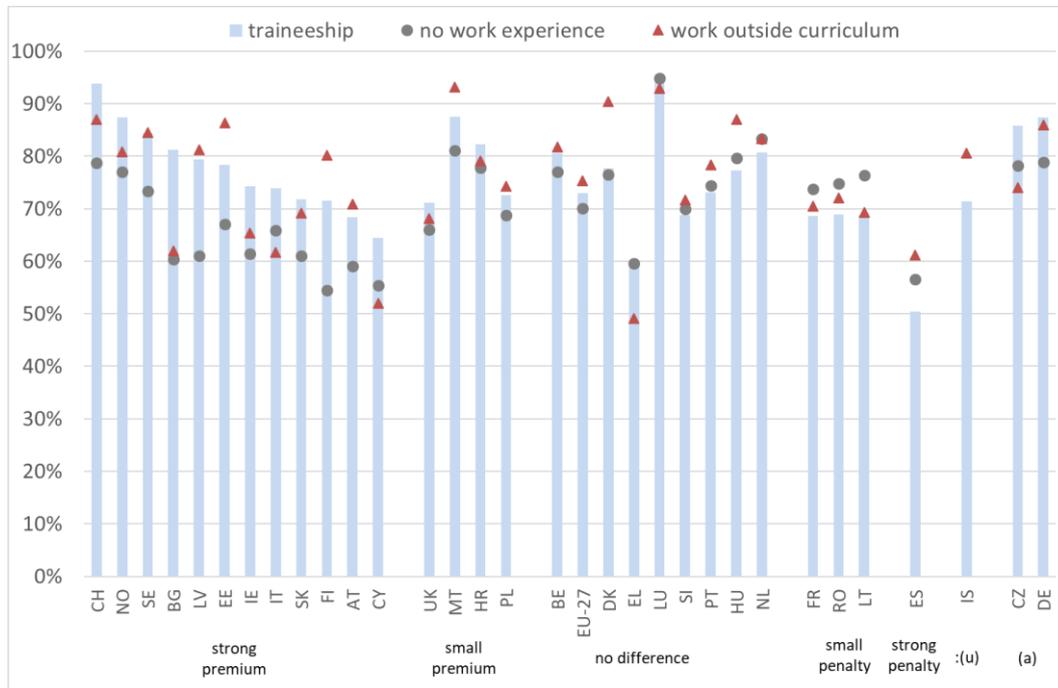
Labels: 'Apprenticeship': apprenticeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: No respondents available for apprenticeships: BG, LV. Confidential data for no work experience: IS. Confidential data for work outside the curriculum: BG, CY, LV, LT. Confidential data for apprenticeships: EE, CY, LT, LU, PT, RO. Low reliability data on no work experience, too low to be published: FR, CY, LT, LU, MT, FI, SE. Low reliability data on work outside the curriculum, too low to be published: EE, IE, FR, HR, IS, LU, MT, PT, RO. Low reliability data on apprenticeships, too low to be published: BE, IE, HR, IS, IT, SE. Low reliability data on no work experience, flagged publication: DK, EE, HR, LV, HU, SI, CH. Low reliability data on work outside the curriculum, flagged publication: BE, DK, EL, ES, AT, PL, SI, SK, FI, CH. Low reliability data on apprenticeships, flagged publication: EL, ES, FR, MT, NO, PL, SI, SK, FI.

Data: Table A.11 in Annex 12.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

Figure 44. Share of graduates with tertiary-level qualification (ISCED 5-8) working in a highly skilled job by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education and employed), 2016



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

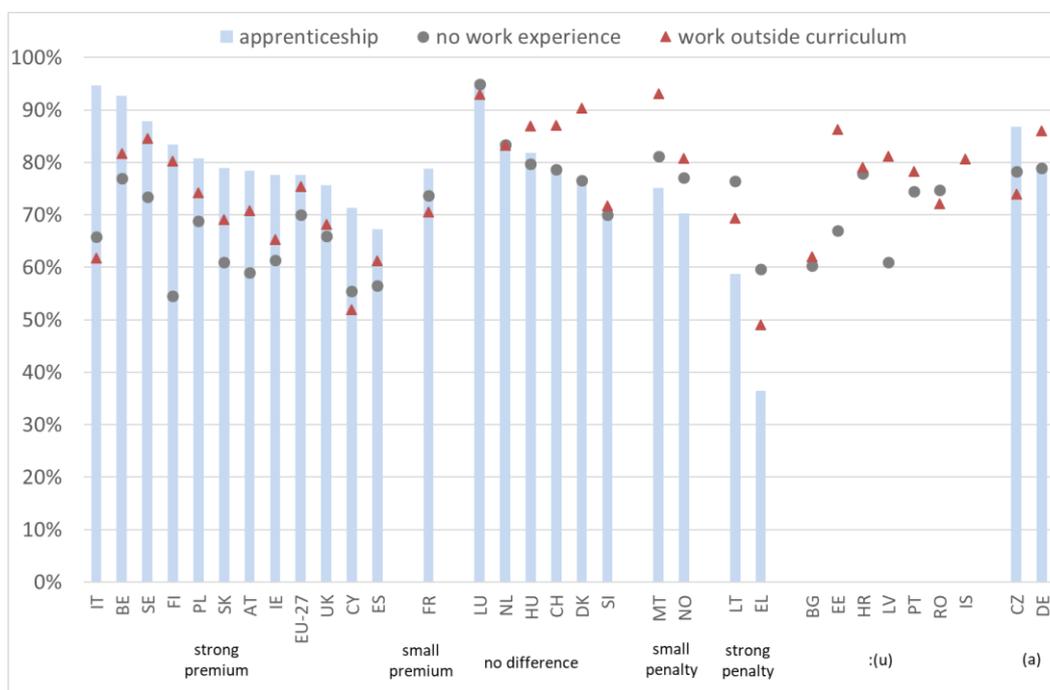
Labels: 'Traineeship': traineeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: Low reliability data on no work experience, too low to be published: IS. Low reliability data on no work experience, flagged publication: SI. Low reliability data on work outside the curriculum, flagged publication: HR. Low reliability data on traineeships, flagged publication: HR.

Data: Table A.11 in Annex 12.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

Figure 45. **Share of graduates with a tertiary-level qualification (ISCED 5-8) working in a highly skilled job by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education and employed), 2016**



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

Labels: 'Apprenticeship': apprenticeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: No respondents available for apprenticeships: BG. Low reliability data on no work experience, too low to be published: IS. Low reliability data on apprenticeships, too low to be published: EE, HR, IS, LV, PT, RO. Low reliability data on no work experience, flagged publication: SI. Low reliability data on work outside the curriculum, flagged publication: HR. Low reliability data on apprenticeships, flagged publication: LT, LU, MT, SI.

Data: Table A.11 in Annex 12.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

4.4. Not searching for another job

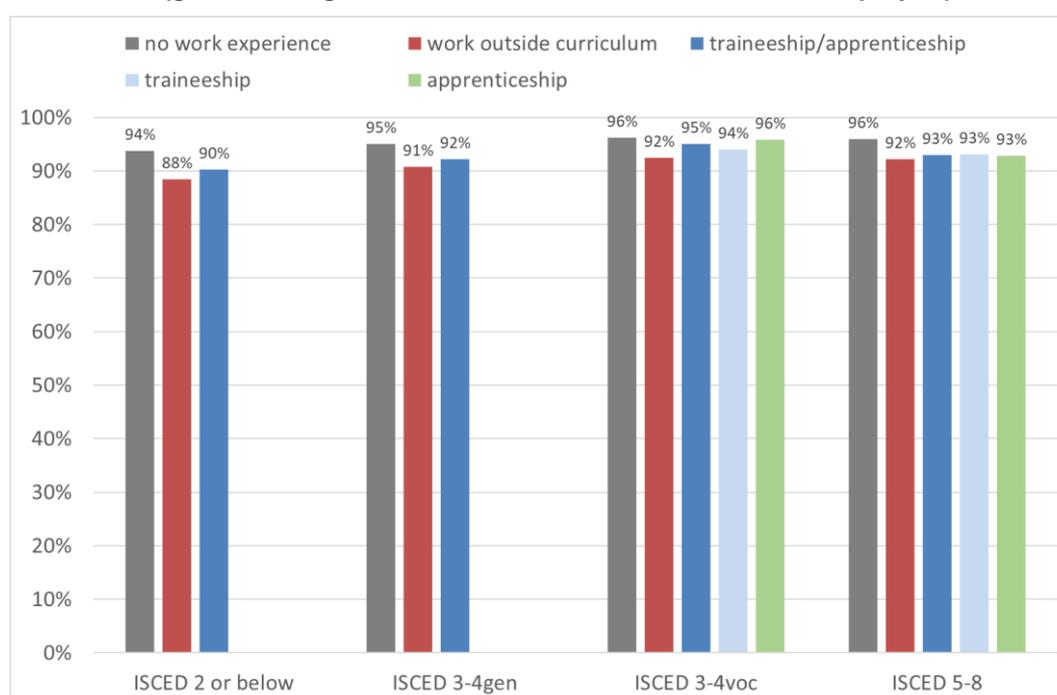
A fourth variable considered is whether or not employed graduates are looking for another job.

To avoid flagging issues related to low numbers of observations and publication thresholds (Annex 13), and to use a possibly positive outcome, the indicator selected focuses on the share of graduates not looking for another job.

Figure 46 presents the share of employed graduates who are not looking for another job by education level and work experience during their highest education attained at the EU-27 level. Figure 46 shows that this share is higher than 90% for all combinations of education level and work experience except for graduates with

low levels of education who worked outside the curriculum (88%). In all education levels considered, it is observed that the shares of graduates not looking for another job is the highest among those with no work experience during education, and the lowest among those who worked outside the curriculum. Among graduates from medium-level vocational education, 94% of those with a traineeship experience and 96% those with an apprenticeship experience are not looking for another job. Some 93% of tertiary education graduates with an apprenticeship experience are not looking for another job, with no considerable difference compared to those with a traineeship experience.

Figure 46. **Share of graduates not looking for another job by highest education attained and type of work experience at that level, including traineeships and apprenticeships (EU-LFS AHM 2016 def.), EU-27 (graduates aged 20-34, not in formal education and employed), 2016**



NB: 'No work experience': no work experience during highest level of education.

'Work outside curriculum': work experience outside curriculum.

'Traineeship/apprenticeship': traineeships/apprenticeships (EU-LFS AHM 2016 def.).

'Traineeship': traineeships (EU-LFS AHM 2016 def.).

'Apprenticeship': apprenticeships (EU-LFS AHM 2016 def.).

'ISCED 2 or below': low-level education, i.e. at most lower secondary education.

'ISCED 3-4 gen': general medium-level education.

'ISCED 3-4 voc': vocational medium-level education.

'ISCED 5-8': tertiary education.

Data: Table A.12 in Annex 13.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

The shares of employed graduates not looking for another job, for medium-level vocational education (ISCED 3-4 VOC) at country level, are displayed in Figure 47 (with a focus on those with a traineeship experience) and in Figure 48 (with a focus on those with an apprenticeship experience). The same is done for tertiary education graduates in Figure 49 (focus on traineeship) and Figure 50 (focus on apprenticeships). A table with the underlying data can be found in Annex 13. To consider the benefit of traineeships or apprenticeships, in each figure the percentage of employed graduates not looking for another job is displayed for graduates with a traineeship (or apprenticeship) experience and for employed graduates with a similar education but with no work experience during the highest level of education attained (no participation in traineeships and apprenticeships, and no work experience outside the curriculum). Based on specific comparisons, countries can be clustered in the following groups:

- (a) considerable premium: where the share of employed graduates not looking for another job is higher for traineeship/apprenticeship graduates than for graduates with no work experience during their highest education attained by more than 5%;
- (b) small premium: where the share of employed graduates not looking for another job is higher for traineeship/apprenticeship graduates than for graduates with no work experience during their highest education attained 2.5-5%;
- (c) no difference: where the share of employed graduates not looking for another job calculated for traineeship/apprenticeship graduates and for graduates with no work experience during their highest education attained differ by less than 2.5%;
- (d) small penalty: where the share of employed graduates not looking for another job is lower for traineeship/apprenticeship graduates than the corresponding share for graduates with no work experience during their highest education attained and where the difference is 2.5-5%;
- (e) considerable penalty: where the share of employed graduates not looking for another job is lower for traineeship/apprenticeship graduates than the corresponding share for graduates with no work experience during their highest education attained and where the difference is more than 5%.

4.4.1. Graduates from vocational medium-level education

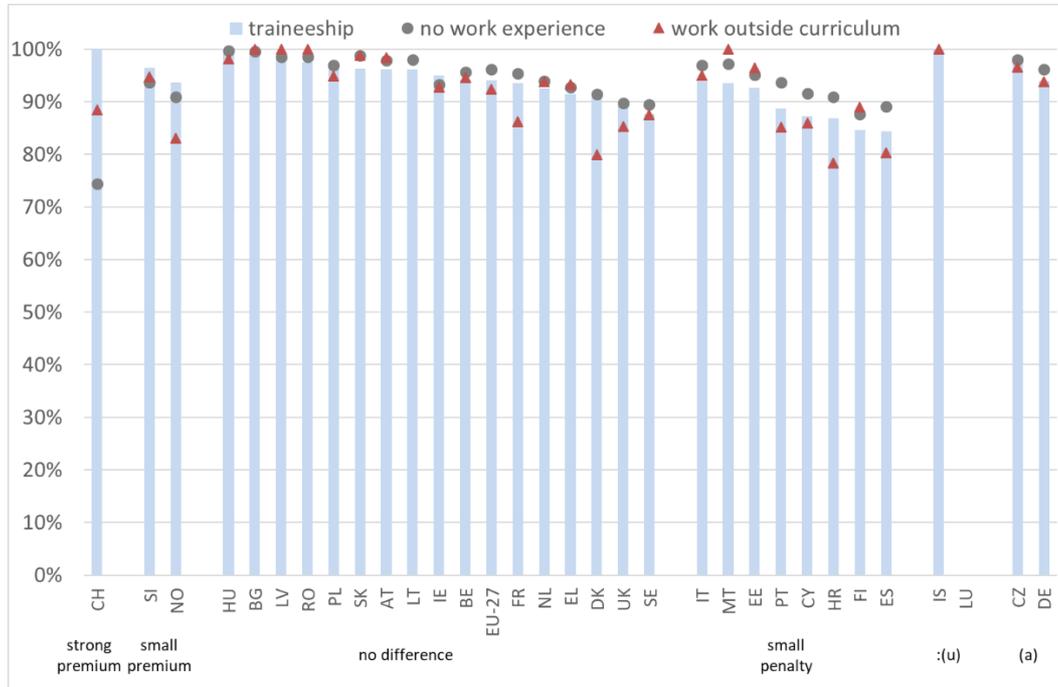
Figure 47 and Figure 48 indicate that, in most countries, more than 90% of apprenticeship and traineeship graduates with a medium-level vocational (ISCED 3-4 VOC) qualification are not looking for another job. This share is lower than 90% for traineeship graduates in Spain, Croatia, Cyprus, Portugal, Finland, Sweden and

the United Kingdom, and lower than 90% for apprenticeship graduates in Cyprus, the Netherlands, Sweden and Switzerland.

Figure 47 shows that, among graduates from medium-level vocational education, the differences between those who had a traineeship as part of it and those without work experience during it are relatively small in 16 countries. This is also the case for the EU-27 on average. In Norway, Slovenia and Switzerland, traineeship graduates have higher shares of people who are not looking for another job, compared to graduates with no work experience. In eight countries, the opposite is found: here, traineeship graduates responded that they were looking for another job more often than graduates with no work experience (relative difference of more than 2.5%).

Figure 48 shows that in 11 countries and the EU-27 on average, the shares of graduates not looking for another job do not show considerable differences, or only show small differences, compared with graduates from medium-level vocational education with an apprenticeship and graduates with no work during the same type of education. In Croatia, Spain and Switzerland, apprenticeship graduates have a premium of 5% or more over graduates with no work experience. In Ireland, Italy and Finland, graduates from medium-level vocational education with an apprenticeship experience were no more likely to be looking for another job than their counterparts who had no work experience during their education, but the differences were smaller. In Belgium, Cyprus, the Netherlands and Slovakia apprenticeship graduates were found to be not looking for another job less often than graduates with no work experience (relative difference of more than 2.5%).

Figure 47. **Share of graduates with at most a medium-level vocational qualification (ISCED 35, 45) not looking for another job by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education and employed), 2016**



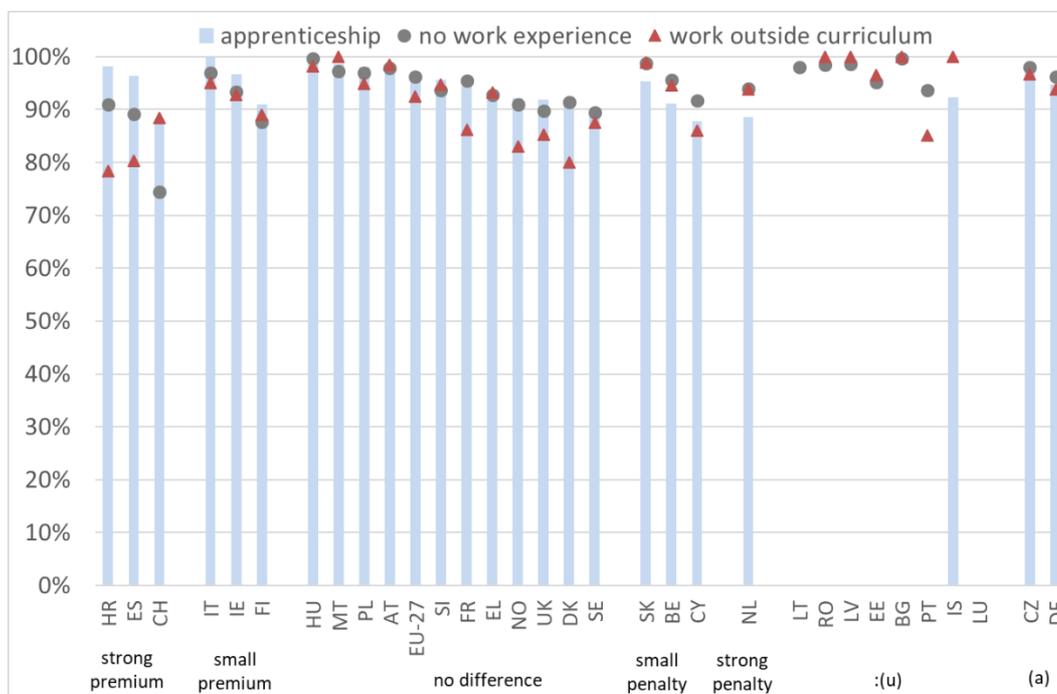
NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

Labels: 'Traineeship': traineeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: Confidential data for no work experience: IS. Low reliability data on work outside the curriculum, too low to be published: LT, LU. Low reliability data on no work experience, too low to be published: LU. Low reliability data on traineeships, too low to be published: LU. Low reliability data on no work experience, flagged publication: MT. Low reliability data on work outside the curriculum, flagged publication: BG, EE, HR, LV, MT. Low reliability data on traineeships, flagged publication: DK, MT, NO. Data: Table A.12 in Annex 13.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

Figure 48. **Share of graduates with at most a medium-level vocational qualification (ISCED 35, 45) not looking for another job by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education and employed), 2016**



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

Labels: 'Apprenticeship': apprenticeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: No respondents available for apprenticeships: BG. Confidential data for no work experience: IS. Low reliability data on no work experience, too low to be published: LT, LU. Low reliability data on work outside the curriculum, too low to be published: LT, LU. Low reliability data on apprenticeships, too low to be published: EE, LV, LT, PT, RO, LU. Low reliability data on no work experience, flagged publication: MT. Low reliability data on work outside the curriculum, flagged publication: BG, EE, HR, LV, MT. Low reliability data on apprenticeships, flagged publication: HR, CY, MT.

Data: Table A.12 in Annex 13.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

4.4.2. Graduates from tertiary education

Figure 49 and Figure 50 show results on the share of graduates from tertiary education not looking for another job. For tertiary-level graduates with a traineeship experience as part of their highest education, the differences with their counterparts with no work experience in terms of (not) looking for another job are very small in 16 countries. In three countries (Cyprus, Finland and Iceland), tertiary-level graduates with a traineeship experience are less likely to look for another job compared to graduates with no work experience during their highest education. In 11 countries, the opposite is found: traineeship graduates more frequently look for another job compared to graduates with no work experience.

The relative difference is between 2.5 and 5% in France, Italy, Portugal, Switzerland and the EU-27 on average. In the Netherlands, Norway, Slovenia, Spain, Sweden and the United Kingdom the relative difference is larger than 5%.

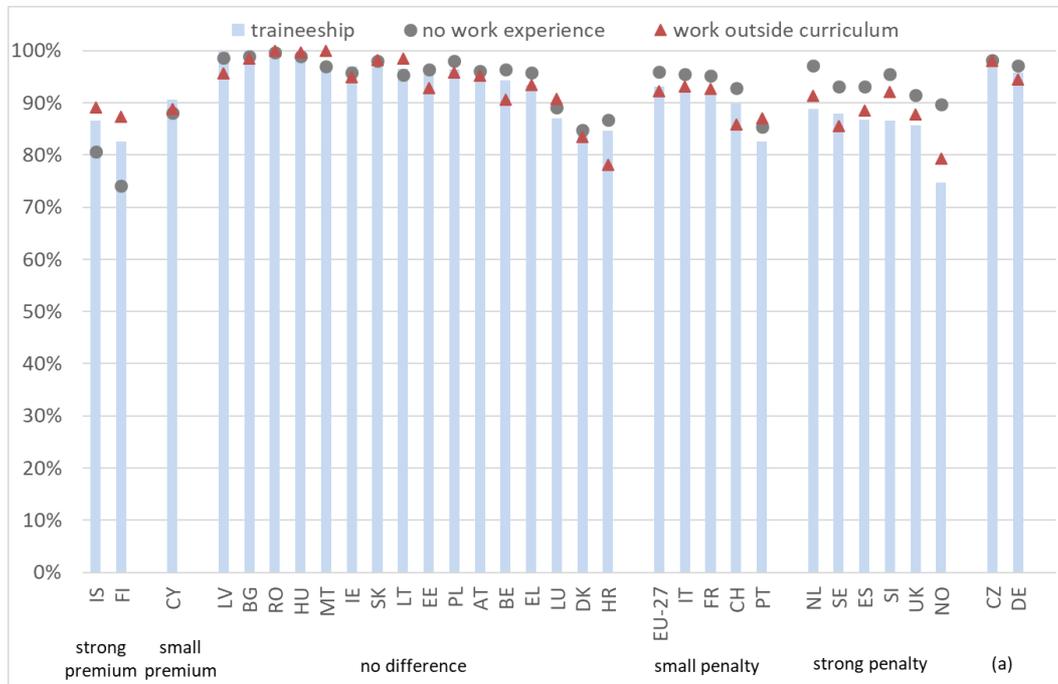
Figure 50 focuses on tertiary-level graduates who were apprentices and are not looking for another job. In only seven countries are the relative differences between apprenticeship tertiary-level graduates and their counterparts without work experience during it smaller than 2.5%. In four countries (Denmark, Croatia, Cyprus and Finland), apprenticeship graduates are not looking for another job more frequently (relative difference of more than 5%) than graduates without work experience. This premium is smaller in, Estonia, Ireland, Lithuania, Luxembourg and Malta. In eight countries, results indicate that tertiary-level graduates with an apprenticeship more frequently look for another job than their counterparts without work experience during their tertiary education. In the EU-27 on average, tertiary level graduates with apprenticeship are found to be slightly more frequently looking for another job than graduates without work experience during tertiary education.

4.4.3. Summary of findings at the EU-27 level

Among graduates from medium-level vocational education, 94% of those who had a traineeship experience and 96% of those who had an apprenticeship experience as part of it were not looking for another job. No considerable differences in the share of graduates who are not looking for another job were found between apprenticeship/traineeship graduates and graduates with no work experience during their medium-level vocational education.

Among tertiary education graduates, 93% of those with a traineeship experience and 93% of those with apprenticeship experience are not looking for another job. Differences with graduates who did not acquire any work experience in tertiary education are also small or negligible.

Figure 49. **Share of graduates with a tertiary-level qualification (ISCED 5-8) not looking for another job by selected types of work experience at their highest education attained: traineeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education and employed), 2016**



NB: (u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

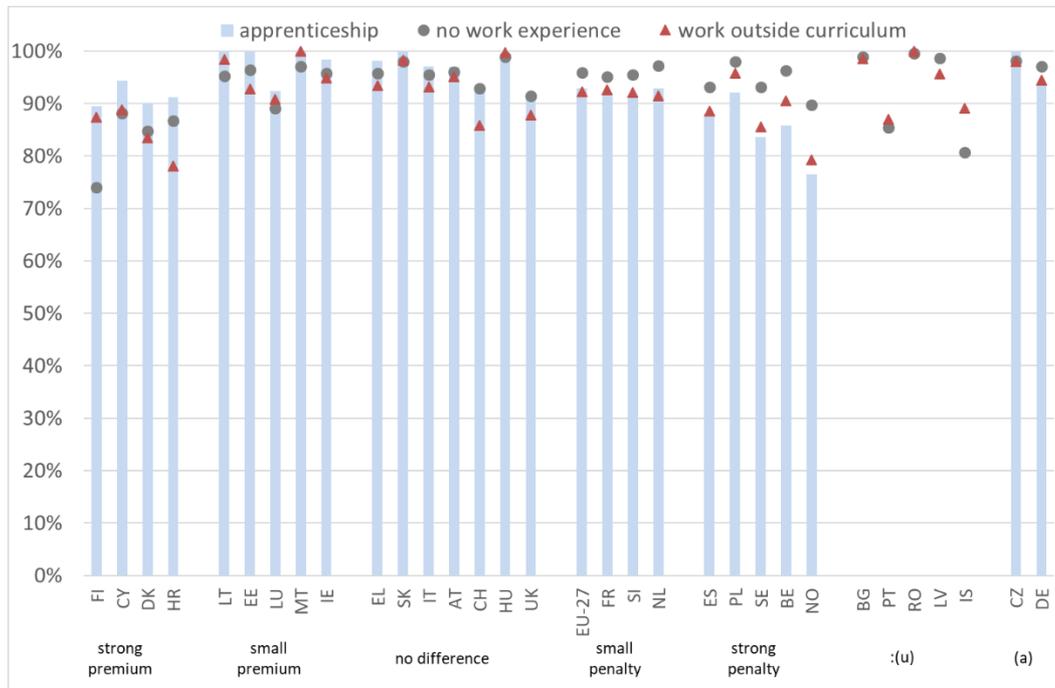
Labels: 'Traineeship': traineeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: Low reliability data on work outside the curriculum, flagged publication: HR. Low reliability data on apprenticeships, flagged publication: HR.

Data: Table A.12 in Annex 13

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

Figure 50. **Share of graduates with a tertiary-level qualification (ISCED 5-8) not looking for another job by selected types of work experience at their highest education attained: apprenticeship experience (EU-LFS AHM 2016 def.), work outside the curriculum, no work experience (graduates aged 20-34 not in formal education and employed), 2016**



NB: :(u): Flagged value, not published. (a): High item non-response (>15%), results to be treated with caution: DE, CZ.

Labels: 'Apprenticeship': apprenticeships (EU-LFS AHM 2016 def.). 'Work outside curr.': work outside curriculum. 'No work experience': no work experience during highest level of education.

Flags: No respondents available for apprenticeships: BG. Low reliability data on apprenticeships, too low to be published: IS, LV, PT, RO. Low reliability data on work outside the curriculum, flagged publication: HR. Low reliability data on apprenticeships, flagged publication: EE, HR, MT, SI.

Data: Table A.12 in Annex 13.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

CHAPTER 5.

Multivariate analysis on employment status and non-precariousness of employment

Chapter 5 presents and summarises the results of logistic regression analyses on employment status and non-precariousness of the main job. The analyses aim at investigating the relationship of each of these two dependent variables with the experience of work-based learning as part of the highest level of education in the form of apprenticeship or traineeship, while controlling for other sociodemographic factors (altogether considered as independent variables).

For each dependent variable, Chapter 5 first discusses the findings of a multilevel logistic regression model, based on data pooled for all countries and taking into account clustering at the country level. Then it summarises the results of country-specific logistic regression analyses.

The main independent variables of interest in the (multilevel) logistic regression analyses combine information on the highest level of educational attainment, its orientation and its work-based nature.

Graduates have been distinguished as follows:

- (a) graduates with at most a low-level education (lower secondary education or below) and labelled in tables of this chapter as ISCED 2 or below;
- (b) graduates having completed at most a medium-level general education (ISCED 3-4 of general orientation) and labelled in tables of this chapter as GEN34;
- (c) graduates having completed at most a medium-level vocational education (ISCED 3-4 of vocational orientation) who had a work-based learning experience as part of it (in the form of traineeship or apprenticeship as defined for this dataset), labelled in tables of this chapter as WBV34;
- (d) graduates having completed at most a medium-level vocational education (ISCED 3-4 of vocational orientation) who had no work-based learning experiences as part of it (in the form of apprenticeship or traineeship as defined for this dataset), labelled in tables of this chapter as SBV34;
- (e) graduates with at most a tertiary-level education (ISCED 5-8) who had a work-based learning experience as part of it (in the form of traineeship or apprenticeship as defined for this dataset) and labelled in tables of this chapter as WBT58;
- (f) graduates with at most a tertiary-level education (ISCED 5-8) who had no work-based learning experience (in the form of traineeship or apprenticeship

as defined for this dataset) as part of it, labelled in tables of this chapter as SBT58.

Six corresponding variables have been derived supporting such distinction as displayed in Table 1 of Chapter 2. Work-based learning is understood here as work experience in the form of an apprenticeship or traineeship occurring as part of the highest education attained. The graduates who had no work-based learning experience, as part of their highest education, include graduates who had no apprenticeship or traineeship experience as part of their highest education attained and those who had some work experience during, but outside, their highest education attained.

Each stepped model of the multilevel logistic regression analysis and each model of the country-specific logistic regression analysis has been implemented twice: once with WBV34 as the reference category and once with WBT58 as the reference category. This allowed investigating how the presence/absence of a work-based learning experience at different education levels relates to the labour market outcomes.

The multilevel logistic regression analyses have a stepped structure. In a first step, a null model is estimated. The null model is a model in which no independent variable is included and only the intercept is allowed to vary between countries. This model is used to calculate the intraclass correlation. The ICC presents the proportion of the variance of the dependent variable that is situated at the country level. The higher the ICC, the more important country-level variables are to explain the outcome variable. The second model is a random intercept model, in which the variables on educational attainment and work-based learning are included. In the third model, we add the sociodemographic variables to the analysis.

In addition to the multilevel logistic regression analyses, separate logistic regression analysis has been performed for each country. These models also follow the stepped structure: first the role of work-based learning by educational attainment is modelled without the sociodemographic variables and then these are added to the model.

The sociodemographic control variables in the models are:

- (a) age;
- (b) sex;
- (c) country of birth;
- (d) marital status.

5.1. Employment status

5.1.1. Multilevel logistic regression analysis

The results of the multilevel logistic regression analysis with employment status as a dependant variable are presented in Table 2. In Models 1A and 2A, the reference category for the analysis is work-based learning as part of medium-level vocational education (WBV34). These two models allow to assess the differences between having or not having experienced work-based learning for medium-level vocational education graduates. In Models 1B and 2B, the reference category is work-based learning as part of tertiary education. These two models allow us to estimate the impact of work-based learning for graduates from tertiary education.

In the null model, no independent variables are included. Based on the results of this model, two conclusions can be drawn. First, the analysis reveals that respondents between 20 and 34, who are not in formal education (i.e. sample of the analysis), are 3.78 times more likely to be employed than not employed. Second, the intraclass correlation indicates that 4% of the variance of employment status is situated at the country level.

When considering the results of Model 1A and Model 2A, the relationship between work-based learning in vocational medium-level education and employment status can be analysed in more detail. The estimates show that graduates with low levels of education, graduates from medium-level general education, and graduates from medium-level vocational education without work-based learning experiences are all significantly less likely to be employed than graduates of vocational medium-level education with a WBL experience (Model 1A). After adding the sociodemographic variables in Model 2A, the estimated coefficients for the variables measuring education level and WBL stay relatively stable. It is found that women are less likely to be employed than men, that married persons are less likely to be employed than those who are not married, that native-born respondents are more likely to be employed than those who are foreign-born, and that those in the 30 to 34 age category have the highest chances of employment.

In Models 1B and 2B, the reference category for analysis is assumed to be work-based learning in tertiary-level education (WBT58). The results of both models show that graduates with this educational background have a significantly higher likelihood of being employed, compared to graduates with low- and medium-level education and also compared to graduates from tertiary education with no work-based learning experience. This result holds both in the model with and without sociodemographic control variables.

Focusing on the differences between graduates with and without work-based learning experiences in vocational medium-level education (Models 1A and 2A) and in tertiary education (Models 1B and 2B), it is possible to conclude that graduates without a WBL experience as part of their highest education are significantly less likely to be employed than graduates with work-based learning.

The estimates do, however, point to a small effect size (Chen et al., 2010). This small effect size is probably caused by the fact that graduates without a work-based learning experience also include graduates who had a work experience outside the curriculum (for whom employment prospects tend to be more favourable than for those without any sort of work experience). Had these graduates been excluded from the analysis, the employment premium for WBL graduates could be reasonably expected to be higher. This expectation is supported by the data in Figure 31, where it can be observed that the employment rates of graduates from medium-level vocational education and from tertiary education without any type of work experience during education are considerably lower than the employment rate of graduates who worked outside the curriculum.

To illustrate the logistic regression estimates and odds ratios, the probabilities of being employed for the different educational backgrounds have been calculated for three specific profiles of graduates:

- (a) native-born married men between 30 and 34 years old;
- (b) native-born married women between 30 and 34 years old;
- (c) non-native-born unmarried men between 20 and 24 years old.

The estimated probabilities of being employed are presented in Figure 51. For all profiles, the probability of being employed is the lowest for those with a low level of education. The probability of being employed is the highest for graduates of work-based programmes in tertiary education. Although with small differences, the probability of being employed is systematically higher for graduates with a work-based learning experience as part of their highest education, than for those without.

Table 2. **Multilevel logistic regression analyses on employment status (being employed versus being unemployed/inactive) controlling for highest education attained, experience of work-based learning as part of it and sociodemographic background variables**

	Null model				Model 1A (ref= WBV34)				Model 2A (ref= WBV34)				Model 1B (ref= WBT58)				Model 2B (ref= WBT58)			
	Estimate	S.E.	O.R.	P<0.001	Estimate	S.E.	O.R.	P<0.001	Estimate	S.E.	O.R.	P<0.001	Estimate	S.E.	O.R.	P<0.001	Estimate	S.E.	O.R.	P<0.001
Intercept	1.33	0.07	3.78	*	1.52	0.07	4.55	*	1.83	0.09	6.24	*	2.14	0.07	*		2.51	0.09	12.34	*
Education level and work-based learning																				
ISCED 2 or below					-1.11	0.03	0.33	*	-1.12	0.03	0.32	*	-1.73	0.04	0.18	*	-1.81	0.04	0.16	*
GEN34					-0.43	0.03	0.65	*	-0.31	0.03	0.73	*	-1.05	0.04	0.35	*	-0.99	0.04	0.37	*
SBV34					-0.26	0.03	0.77	*	-0.23	0.03	0.79	*	-0.89	0.04	0.41	*	-0.91	0.04	0.40	*
WBV34 (ref. Model 1A and 2A)													-0.62	0.04	0.54	*	-0.68	0.04	0.51	*
WBT58 (ref. Model 1B and 2B)					0.62	0.04	1.86	*	0.68	0.04	1.98	*								
SBT58					0.31	0.03	1.36	*	0.38	0.03	1.46	*	-0.32	0.04	0.73	*	-0.30	0.04	0.74	*
Sex (ref. male)									-0.81	0.02	0.45	*					-0.81	0.02	0.45	*
Marital status (ref. not married)									-0.07	0.02	0.93	*					-0.07	0.02	0.93	*
Country of birth (ref. not native)									0.37	0.03	1.45	*					0.37	0.03	1.45	*
Age (ref. 30-34)																				
20-24									-0.62	0.03	0.54	*					-0.62	0.03	0.54	*
25-29									-0.21	0.02	0.81	*					-0.21	0.02	0.81	*
Fit statistics																				
AIC	77193.61				73558.65				69129.69				73558.65				69129.69			
BIC	77196.47				73568.69				69146.90				73568.69				69146.90			
-2LL	77189.61				73544.65				69105.69				73544.65				69105.69			
Covariance	0.15				0.13				0.17				0.13				0.17			
ICC	0.04				0.04				0.05				0.04				0.05			

NB: * p<0.001.

'ISCED 2 or below': low level of education, i.e. at most lower secondary education.

'GEN34': general medium-level education, ISCED 3-4.

'SBV34': vocational medium-level education, ISCED 3-4 with no experience of work-based learning as part of it.

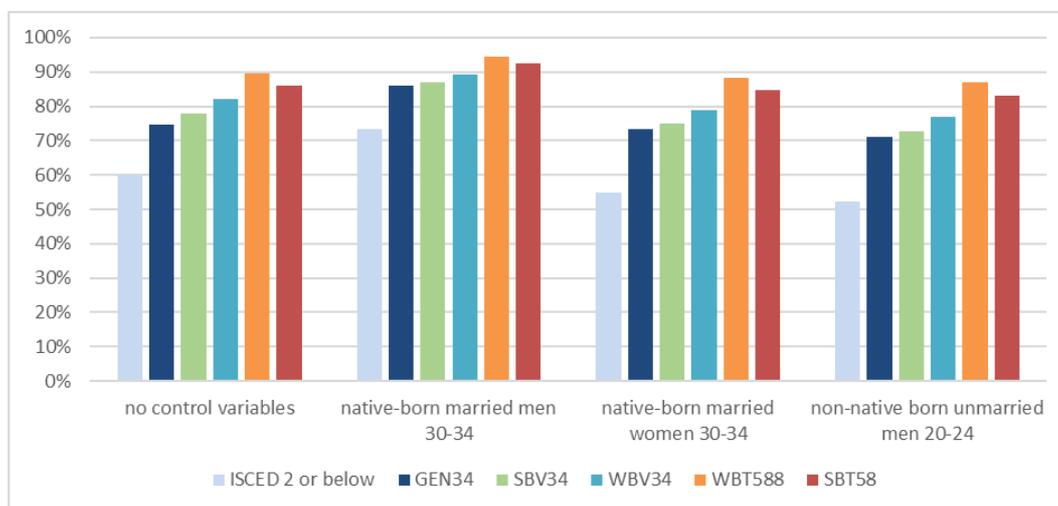
'WBV34': vocational medium-level education, ISCED 3-4, with experience of work-based learning as part of it.

'WBT58': tertiary education, ISCED 5-8, with experience of work-based learning as part of it.

'SBT58': tertiary education, ISCED 5-8, with no experience of work-based learning as part of it.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculation.

Figure 51. **Probability of being employed by highest education level and work experience**



NB: 'ISCED 2 or below': low level of education, i.e. at most lower secondary education.

'GEN 34': medium-level general education, ISCED 3-4.

'SBV34': medium-level vocational education, ISCED 3-4, with no experience of work-based learning as part of it.

'WBV34': medium-level vocational education, ISCED 3-4, with experience of work-based learning as part of it.

'WBT58': tertiary education, ISCED 5-8, with experience of work-based learning as part of it.

'SBT58': tertiary education, ISCED 5-8, with no experience of work-based learning as part of it.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculation.

5.1.2. Country-specific logistic regression analyses

Logistic regression analyses on employment status (being employed versus not being employed) have been also performed separately for all countries with available data. As there are no observations for graduates of lower secondary education in Czechia, results for this country are not presented. The findings for Iceland are also not presented because the number of weighted observations was too low to calculate reliable estimates for this country. This brings the total number of countries for which the analyses are performed to 29. In Annex 15, the estimates and odds ratios for these 29 countries are presented separately.

Table 3 summarises the main findings of the logistic regression analyses with the control variables. The second column presents the findings for graduates from medium-level vocational education with WBL experiences (Model 2A) and the third column presents the findings for tertiary education with WBL experiences (Model 2B). In these columns, there is a summary of significant ($p < 0.05$) positive logistic regression estimates with a '+' and significant ($p < 0.05$) negative logistic regression estimates with a '-'. The '+' (or the '-') indicates a significantly higher (or lower) likelihood of being employed for graduates without a work-based learning experience compared to graduates with a WBL experience.

When looking at differences between graduates with and without a work-based learning experiences in vocational medium-level education, there are no statistically significant differences in 24 countries. In Germany, France, Italy, Sweden and the United Kingdom, graduates without a WBL experience have a significantly lower likelihood of being employed than the WBL graduates.

Considering the differences between graduates with and without a work-based learning experience as part of tertiary education, it is found that graduates without a WBL experience in Germany, France and Italy are significantly less likely to be employed than graduates of work-based programmes.

On first sight, the lack of significant differences between graduates with and without a WBL experience at the country level appears to contradict the results of the multilevel logistic regression analysis based on pooled data. From a statistical perspective, this apparent contradiction can, however, be explained by two factors. First, the estimate sizes for the differences between graduates with and without a WBL experience in the multilevel model are significant but small. This is in turn related to the fact that the group chosen as comparison to graduates with a work-based learning experience (those without a work experience as part of their highest studies) comprised two different subgroups: those without any type of work experience during their studies and those with some work experience during but outside their studies. The latter experience more favourable employment outcomes and therefore reduce the average differences compared to those with work-based learning experiences as part of their studies. Second, the sample sizes at the country level are considerably smaller than the complete sample that was taken into account in the multilevel analysis. As a consequence, the standard errors of the estimates at the country level are larger than the standard errors in the multilevel model. There can also be a variety of contextual and country-specific factors undermining the relative employability of WBL graduates in some Member States. Although it is found that work-based learning associates on average with higher likelihood of being employed, no evidence is found that this holds in all countries in a statistically significant way.

Table 3. **Summary of findings of country-specific logistic regression analyses on employment status (being employed versus being unemployed/inactive) by highest education attained, experience of work-based learning as part of it and sociodemographic background variables (ref. categories work-based learning as part of vocational medium-level education and as part of tertiary education)**

	SBV34 vs WBV34	SBT58 vs WBT58
AT		
BE		
BG		
CH		
CY		
DE	-	-
DK		
EE		
EL		
ES		
FI		
FR	-	-
HR		
HU		
IE		
IT	-	-
LT		
LU		
LV		
MT		
NL		
NO		
PL		
PT		
RO		
SE	-	
SI		
SK		
UK	-	

NB: +: positive logistic regression estimate with p-value <0.05.

-: negative logistic regression estimate with p-value <0.05.

'SBV34': medium-level vocational education, ISCED 3-4, with no experience of work-based learning as part of it ISCED 3-4.

'WBV34': medium-level vocational education, ISCED 3-4, with experience of work-based learning as part of it.

'WBT58': tertiary education, ISCED 5-8, with experience of work-based learning as part of it.

'SBT58': tertiary education, ISCED 5-8, with no work-based learning experience as part of it.

Data: Tables A.17 and A.19 in Annex 15.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculation.

5.2. Non-precariousness of employment (TEMPDUR)

5.2.1. Multilevel logistic regression analysis

The results of the multilevel logistic regression analysis on non-precariousness (stability) of employment (operationalised as having a working contract with a duration of more than three months, including a permanent one) are presented in Table 4. In Models 1A and 2A, the reference category for the analysis is work-based learning as part of medium-level vocational education. These two models allow to assess the differences between having experienced or not work-based learning for medium-level vocational education graduates. In Models 1B and 2B, the reference category is work-based learning as part of tertiary education. These two models allow to estimate the impact of work-based learning in tertiary education.

In the null model, there are no independent variables. The estimates for the intercept show that respondents between 20 and 34, who are not in formal education (i.e. sample of the analysis), are more likely to have a contract of more than three months than to have a contract up to three months. Only 2% of the respondents had a contract of up to three months. In addition, the intraclass correlation shows that almost one quarter of the variance of the dependent variable is situated at the country level.

Model 1A and Model 2A allow the relationship between work-based learning in vocational medium-level education and the non-precariousness of work to be analysed in more detail. The estimates in Model 1A show that graduates with a low level of education are less likely to have a contract of more than three months than graduates of a work-based programme in vocational medium-level education. The likelihood of non-precarious (stable) employment is not significantly different in the subgroup of graduates from medium-level general education compared to graduates from vocational medium-level education with a work-based learning experience and compared to graduates from vocational medium-level education without a work-based learning experience. After including the control variables in Model 2A, the difference between graduates with a WBL experience in vocational medium-level education and graduates without a WBL experience in tertiary-level education is no longer significant. Regarding the control variables, it is observed that married persons are more likely to have a contract of more than three months than those who are not married, that native-born respondents are more likely to have a contract of more than three months than those who are foreign-born, and that those in the 30 to 34 age category have the highest chances of non-precarious employment.

In Models 1B and 2B, the reference category for analysis is tertiary-level education with a work-based learning experience as part of it. The results of both models show that these graduates have a significantly higher likelihood of being employed in non-precarious jobs, compared to other graduates in low-level and medium-level education, both in the model with and without sociodemographic control variables. The difference between tertiary-level graduates with and without a work-based learning experience is not statistically significant.

When summarising the differences between those with and without a work-based learning experience in vocational medium-level education as well as in tertiary education, it is possible to conclude that there are no statistically significant differences in the non-precariousness of employment based on the models results.

To illustrate the logistic regression estimates and odds ratios, the probabilities of having non-precarious employment for the different educational backgrounds have been calculated for three specific profiles of graduates: native-born married men aged between 30 and 34, native-born married women aged between 30 and 34, and non-native-born unmarried men aged between 20 and 24. The estimated probabilities are presented in Figure 52. The figure shows that the differences in probabilities by highest education level and work experience are very small.

Table 4. **Multilevel logistic regression analyses on non-precariousness of employment (having a contract of more than three months versus having a contract up to three months) controlling for highest education attained, experience of work-based learning as part of it, and sociodemographic background variables**

	Null model				Model 1A (ref= WBV34)				Model 2A (ref= WBV34)				Model 1B (ref= WBT58)				Model 2B (ref= WBT58)			
	Estimate	S.E.	O.R.	P<0.001	Estimate	S.E.	O.R.	P<0.001	Estimate	S.E.	O.R.	P<0.001	Estimate	S.E.	O.R.	P<0.001	Estimate	S.E.	O.R.	P<0.001
Intercept	3.90	0.20	49.33	*	3.82	0.20	45.43	*	3.92	0.23	50.42	*	4.51	0.21	90.89	*	4.44	0.23	84.99	*
Education level and work-based learning																				
ISCED 2 or below					-0.49	0.08	0.61	*	-0.58	0.08	0.56	*	-1.18	0.09	0.31	*	-1.10	0.10	0.33	*
GEN34					-0.15	0.09	0.86		-0.15	0.09	0.86		-0.85	0.10	0.43	*	-0.68	0.10	0.51	*
SBV34					0.02	0.08	1.02		0.04	0.09	1.04		-0.67	0.10	0.51	*	-0.49	0.10	0.61	*
WBV34 (ref. Model 1A and 2A)													-0.69	0.09	0.50	*	-0.52	0.09	0.59	*
WBT58 (ref. Model 1B and 2B)					0.69	0.09	2.00	*	0.52	0.09	1.69	*								
SBT58					0.42	0.08	1.53	*	0.20	0.09	1.23		-0.27	0.10	0.76		-0.32	0.10	0.73	
Sex (ref. male)									0.06	0.05	1.06						0.06	0.05	1.06	
Marital status (ref. not married)									0.43	0.07	1.54	*					0.43	0.07	1.54	*
Country of birth (ref. not native)									0.34	0.08	1.41	*					0.34	0.08	1.41	*
Age (ref. 30-34)																				
20-24									-1.01	0.07	0.36	*					-1.01	0.07	0.36	*
25-29									-0.30	0.06	0.74	*					-0.30	0.06	0.74	*
Fit statistics																				
AIC		14069.26				13855.45				13235.98				13855.45				13235.98		
BIC		14072.13				13865.49				13253.18				13865.49				13253.18		
-2LL		14065.26				13841.45				13211.98				13841.45				13211.98		
Covariance		1.05				1.04				1.08				1.04				1.07		
ICC		0.24				0.24				0.25				0.24				0.25		

NB: * p<0.001.

'ISCED 2 or below': low level of education, i.e. at most lower secondary education.

'GEN34': general medium-level education, ISCED 3-4.

'SBV34': vocational medium-level education, ISCED 3-4 with no experience of work-based learning as part of it.

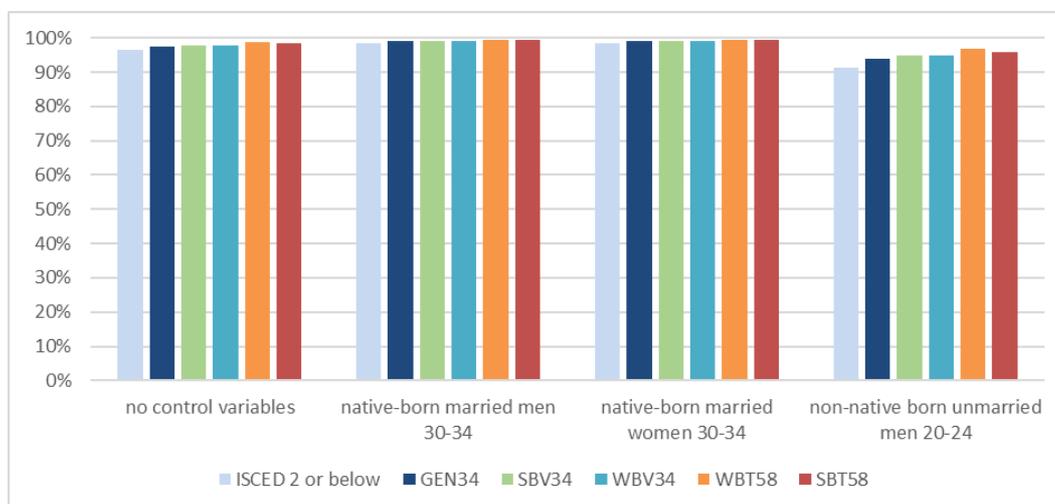
'WBV34': vocational medium-level education, ISCED 3-4, with experience of work-based learning as part of it.

'WBT58': tertiary education, ISCED 5-8, with experience of work-based learning as part of it.

'SBT58': tertiary education, ISCED 5-8, without no experience of work-based learning as part of it.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculation.

Figure 52. **Probability of having non-precarious employment by highest education level and work experience**



NB: 'ISCED 2 or below': low level of education, i.e. at most lower secondary education.

'GEN34': medium-level general education, ISCED 3-4.

'SBV34': medium-level vocational education, ISCED 3-4, with no experience of work-based learning as part of it.

'WBV34': medium-level vocational education, ISCED 3-4, with experience of work-based learning as part of it.

'WBT58': tertiary education, ISCED 5-8, with experience of work-based learning as part of it.

'SBT58': tertiary education, ISCED 5-8, with no experience of work-based learning as part of it.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculations.

5.2.2. Country-specific logistic regression analysis

Logistic regression analyses on non-precariousness of employment have been also performed for the 31 countries separately. Results for 12 countries are not presented, because the number of weighted observations was too low to calculate reliable estimates. These countries are: Bulgaria, Croatia, Cyprus, Czechia, Iceland, Ireland, Latvia, Luxembourg, Malta, Norway, Romania and Switzerland. This brings the total number of countries for which the analyses are performed to 19. In Annex 16, the estimates and odds ratios for these 19 countries separately are presented.

In Table 5, the main findings of the logistic regression analyses with the control variables are displayed. The second column presents the findings for medium-level vocational education (Model 2A) and the third column reports the findings for tertiary education (Model 2B). In these columns, there is a summary of significant ($p < 0.05$) positive logistic regression estimates with a '+' and significant ($p < 0.05$) negative logistic regression estimates with a '-'. The '+' (or the '-') indicates a significantly higher (or lower) likelihood of being employed in a non-precarious job for graduates without a work-based learning experience compared to those who had it.

In line with the results of the multilevel logistic regression analysis, it is found that there are no significant differences in the non-precariousness (stability) of employment between graduates of with and without a work-based learning experience in both medium-level vocational education (second column) and tertiary education (third column) in almost all countries. The only exception is the United Kingdom: in this country, graduates from vocational medium-level education with no experience of work-based learning as part of it are significantly more likely to be employed in a non-precarious job than graduates of work-based programmes in vocational medium-level education.

Table 5. **Summary of findings of country-specific logistic regression analyses on non-precariousness of employment, controlling for highest education attained, experience of work-based learning as part of it and sociodemographic background variables (ref. categories work-based learning as part of vocational medium-level education and as part of tertiary education)**

	SBV34 vs WBV34	SBT58 vs WBT58
AT		
BE		
DE		
DK		
EE		
EL		
ES		
FI		
FR		
HU		
IT		
LT		
NL		
PL		
PT		
SE		
SI		
SK		
UK	+	

NB: +: positive logistic regression estimate with p-value <0.05.

-: negative logistic regression estimate with p-value <0.05.

'SBV34': medium-level vocational education, ISCED 3-4, with no experience of work-based learning as part of it ISCED 3-4.

'WBV34': medium-level vocational education, ISCED 3-4, with experience of work-based learning as part of it.

'WBT58': tertiary education, ISCED 5-8, with experience of work-based learning as part of it.

'SBT58': tertiary education, ISCED 5-8, with no work-based learning experience as part of it.

Data: Table A.21 and Table A.23 in Annex 16.

Source: Eurostat EU-LFS AHM 2016 microdata; own calculation.

CHAPTER 6.

Conclusions

So far, the key source for regular and internationally comparable statistical information on work-based learning has been the annual UOE data collection on formal education (UOE, 2016). In the UOE context, a vocational programme is classified as combined work- and school-based if 25% or more of the curriculum is presented outside the school environment; otherwise, it is classified as school-based.

This source has considerable methodological merits but also limitations. In the absence of an internationally agreed definition of vocational programmes at levels 6 and above of the international standard classification of education, information on combined work and school-based programmes is collected only for ISCED education levels 3, 4 and 5. Second, the 25% threshold does not allow to capture important nuances in the provision of the work-based component, which characterise national systems and their recent reforms. Third, data are collected only on the number of students, and information on graduates and labour outcomes is out of its scope.

This report has made use of a different data source, the 2016 ad hoc module of the EU labour force survey, with a different methodological apparatus and partly different definitions, providing additional statistical information on work-based learning. The prevalence of work-based learning has been measured by referring to the stock of graduates in the population, who have actually experienced it as part of their highest education attained, covering, distinguishing but not excluding important WBL experiences, such as those that were optional, those potentially falling below the UOE 25% threshold and those at tertiary education level. The use of this dataset has also allowed characterising the sociodemographic profile of graduates with WBL experiences and investigating their labour market outcomes in a comparative perspective, relative to their counterparts who did not have those experiences.

The results of this report clearly indicate that there is considerable diversity in Europe as regards the prevalence of work-based learning, the profile of graduates who experienced it and the impact of work-based learning on labour market outcomes. Nevertheless, several main conclusions can be drawn from the research findings.

First, based on the definitions adopted and the data analysed, the report shows that work-based learning is more common than expected based on the

established knowledge derived from the annual joint UNESCO-OECD-Eurostat data collection on formal education. The report finds that, in the EU-27, almost two thirds of young graduates with a medium-level vocational qualification as their highest educational attainment experienced work-based learning as part of those studies. It also shows that almost half of tertiary education graduates have undertaken work-based learning as part of their studies. This outlines prevalence levels far above those which are typically obtained from the UOE data collection (with fewer than 30% of students in medium-level vocational education being enrolled in combined school and work-based learning programmes in the EU). The methodology and the definitions adopted in the 2016 ad hoc module of the EU labour force survey were piloted for the first time on that occasion. They can and should be improved in future. But, with their different characteristics, they reveal higher levels of prevalence, offering a new perspective on the effectiveness of the efforts undertaken over the past year by countries and the EU to increase work-based learning in initial education and to make it a structural feature of the formal education systems.

Second, the study finds and documents a positive association between the experience of work-based learning and employment status of youngsters. In most countries and the EU-27 on average, graduates who had some work-based learning in the form of an apprenticeship or of traineeship experiences, have higher employment rates than graduates with no work experience during their studies. A strong employment premium can be observed particularly for graduates with an apprenticeship experience. The results of the multilevel logistic regression analyses confirmed, overall, that graduates with work-based learning experiences are significantly more likely to be employed than their counterparts without. The analysis therefore confirms that work-based learning is associated with higher employment rates and higher employment chances for graduates who experience it. However, the report does not find that this happens in a systematic and uniform manner across all countries. Findings should be interpreted considering that the absolute and comparative employment levels of graduates with a work-based learning experience are affected by a number of country-specific factors. As far as education policies are concerned, the commitment to quality work-based learning and to lifelong learning for graduates with initial WBL experiences continue being extremely important.

The relationship between work-based learning and quality of employment appears less straightforward. For non-precariousness (stability) of employment, results show that the education level is more influential than having had a work-based learning experience. Regarding the skills intensity of the job, the findings of the descriptive analysis suggest that the share of graduates in high-skilled jobs is

higher for graduates with an apprenticeship experience than for graduates without work experience during their studies at the same level. On average, less structured experiences in the form of a traineeship help, but do not associate with notable differences. The shares of graduates looking for another job are, on average, very similar across different educational backgrounds. Overall, the analysis finds evidence that work-based learning is associated with higher employment rates and chances but it does not find evidence that it combines with better quality of employment as operationalised for this report.

From a research perspective, the need emerges to continue collecting data of this type on work-based learning, possibly improving and simplifying the approach adopted in the 2016 ad hoc module of the EU-LFS and ideally implementing it on a periodic and more frequent basis as part of the core (annual or biannual) section of the EU-LFS. The evidence from the multivariate analysis could be extended to cover other labour market outcomes. The analysis could also be methodologically refined by developing, and including in the multilevel modelling, variables accounting for the characteristics of education systems, labour market settings and macroeconomic contexts at country level; ideally, other variables characterising the quality of the work-based learning experiences of the individual graduates could be included. This would allow better investigation, from a statistical perspective, of the conditions under which work-based learning leads to favourable outcomes. The modelling could also more explicitly account for work experiences during but outside the highest level of education for more refined contrasts and comparisons.

Abbreviations/Acronyms

AHM	ad hoc module
EAfA	European Alliance for Apprenticeships
EENEE	European Commission Network on Economics of Education
EFTA	European Free Trade Association
ETF	European Training Foundation
EU-LFS	EU labour force survey
Eurofound	European Foundation for the Improvement of Living and Working Conditions
IAG-TVET	Interagency Group on Technical and Vocational Education and Training
ICC	intraclass correlation
ICT	information and communications technology
ILO	International Labour Organization
ISCED	international standard classification of education
ISCO	international standard classification of occupations
IVET	initial vocational education and training
LFS	labour force survey
LSE	lower secondary education
MLE	medium-level education
OECD	Organisation for Economic Cooperation and Development
SMEs	small and medium-sized enterprises
UIS	UNESCO Institute for Statistics
UOE	UNESCO-OECD-Eurostat data collection on formal education
VET	vocational education and training
WBL	work-based learning

Country codes

AT	Austria
BE	Belgium
BG	Bulgaria
CH	Switzerland
CY	Cyprus
CZ	Czechia
DE	Germany
DK	Denmark
EE	Estonia
EL	Greece
ES	Spain
FI	Finland
FR	France
HR	Croatia
HU	Hungary
IE	Ireland
IS	Iceland
IT	Italy
LT	Lithuania
LU	Luxemburg
LV	Latvia
MT	Malta
NL	Netherlands
NO	Norway
PL	Poland
PT	Portugal
RO	Romania
SE	Sweden
SI	Slovenia
SK	Slovakia
UK	United Kingdom

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